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The OIL WEEKLY

Exclusively Devoted To The Production and Transportation of Oil and Gas

May 10, 1929 **Volume 53. No. 8**

A PART OF EVERY DOLLAR YOU SPEND TODAY FOR HUGHES TOOLS IS DEVOTED TO A NEVER-CEASING EFFORT ON THE PART OF THE HUGHES TOOL COMPANY TO DEVELOP TOOLS OF EVEN MORE EFFECTIVENESS TO MEET TOMORROW'S REQUIREMENTS OF THE INDUSTRY

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Elliott core drills

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4 FEATURES OF GASO PUMP, FIG. 1508

1 Main and Pinion Shaft bearings are Timken Tapered Roller Bearings.

2 Main and Pinion Gears of continuous tooth Herringbone construction.

3 H-Column Connecting Rod, with babbitt-lined, removable bronze shell at crank end.

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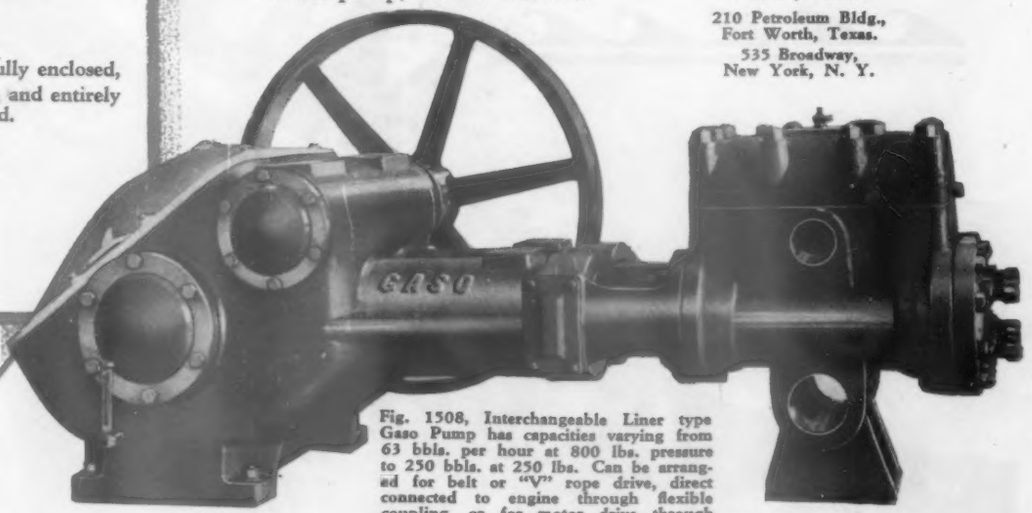

Fig. 1508, Interchangeable Liner type Gaso Pump has capacities varying from 63 bbls. per hour at 800 lbs. pressure to 250 bbls. at 250 lbs. Can be arranged for belt or "V" rope drive, direct connected to engine through flexible coupling, or for motor drive through silent chain or reduction gears.

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with the announcement that the 325 miles of another new line is to be built of 22-inch SMITHWelded Gas Line Pipe.

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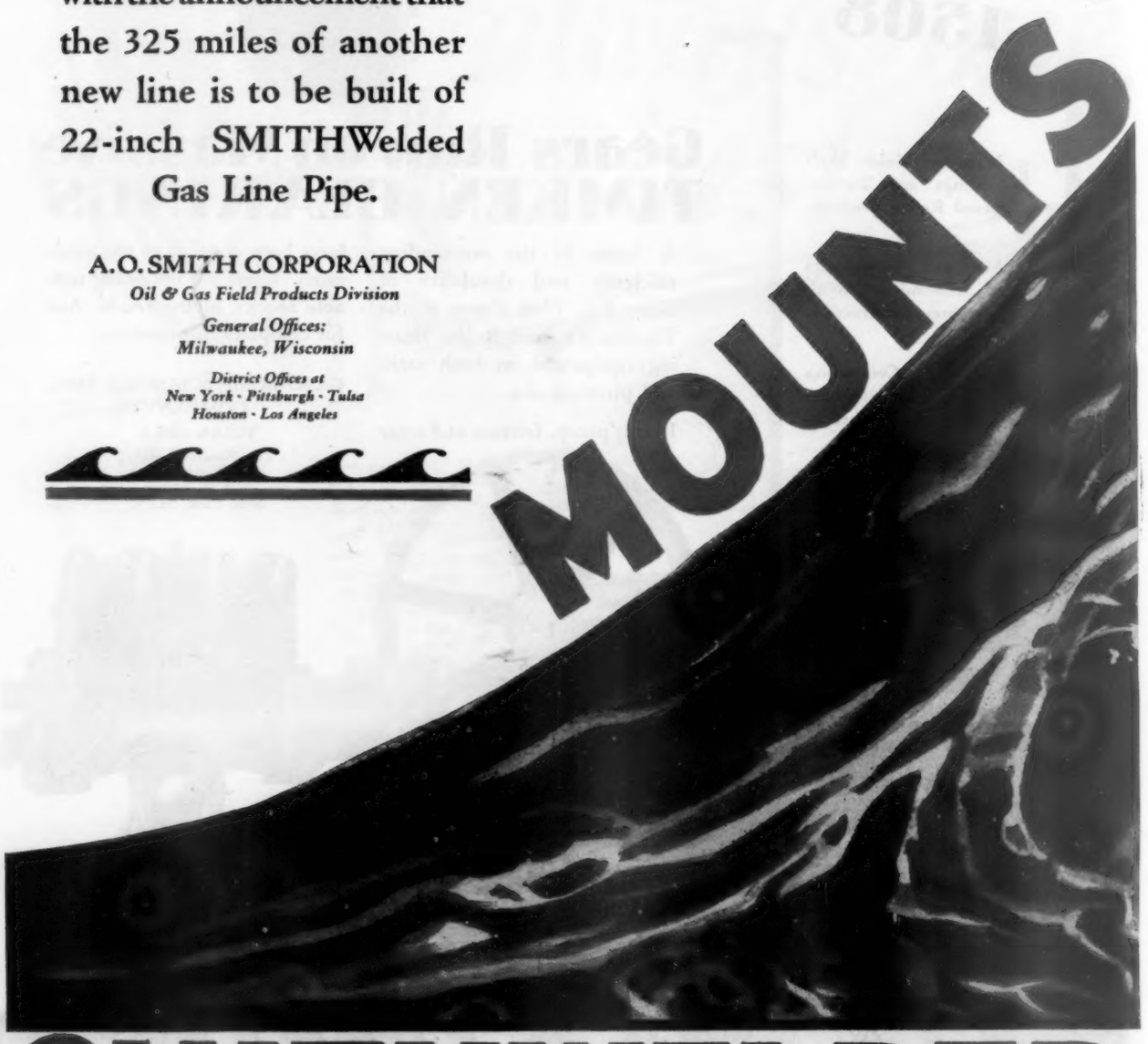
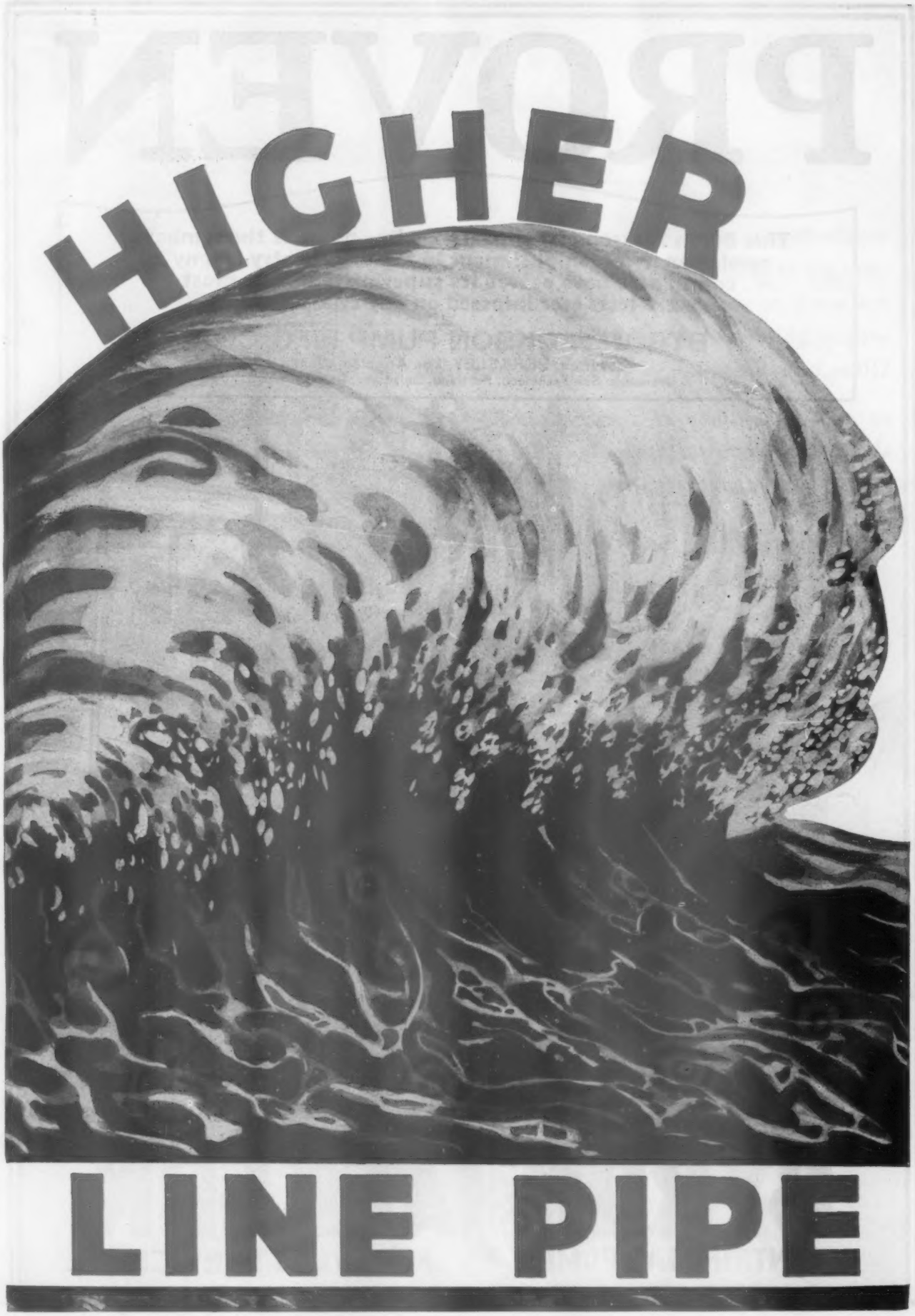


SMITHWELDED

Say you saw it in The OIL WEEKLY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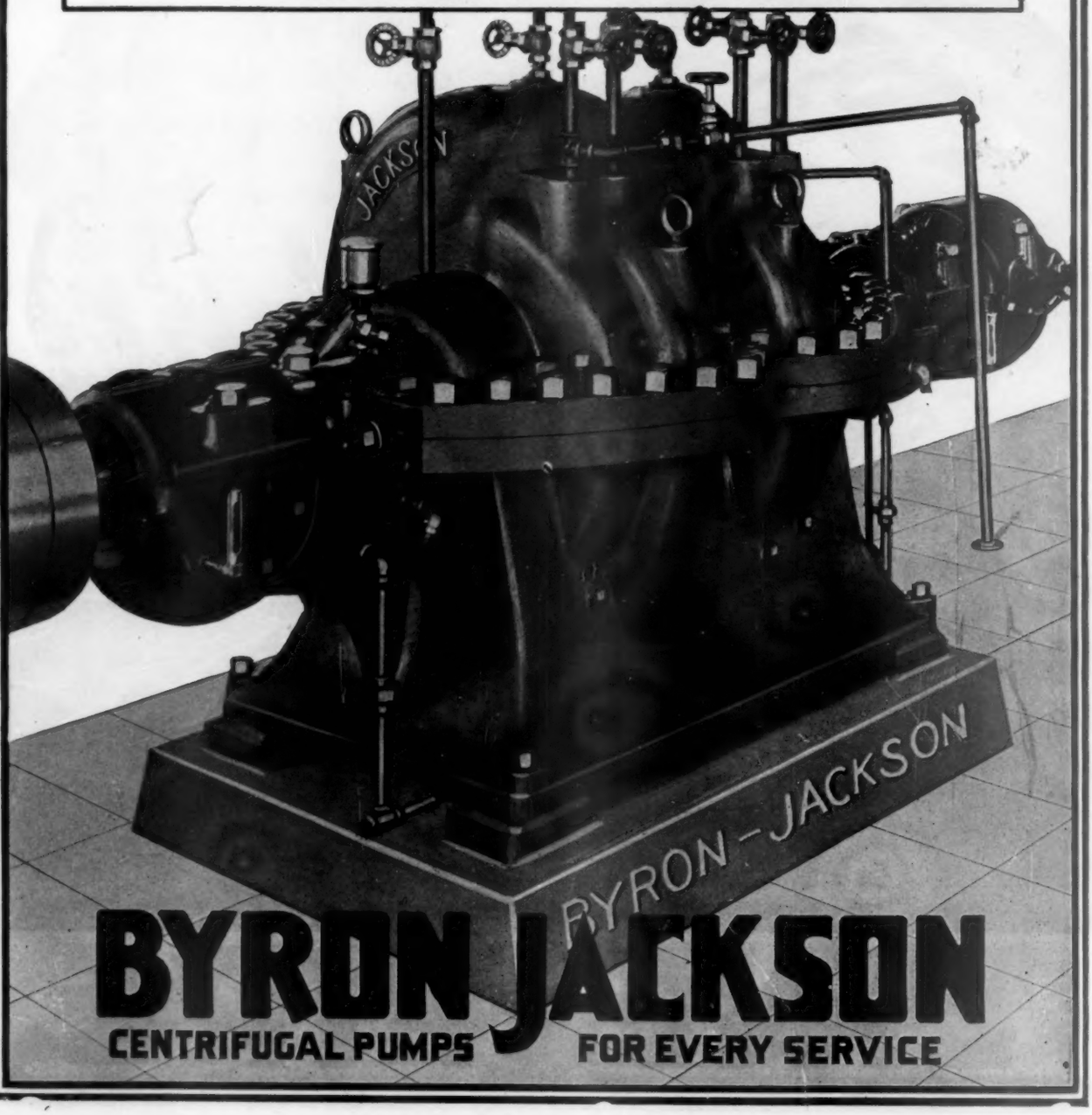
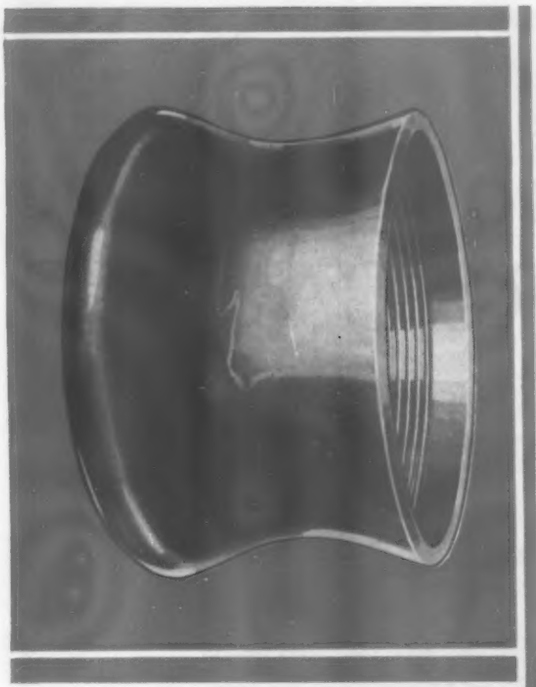


BYRON JACKSON

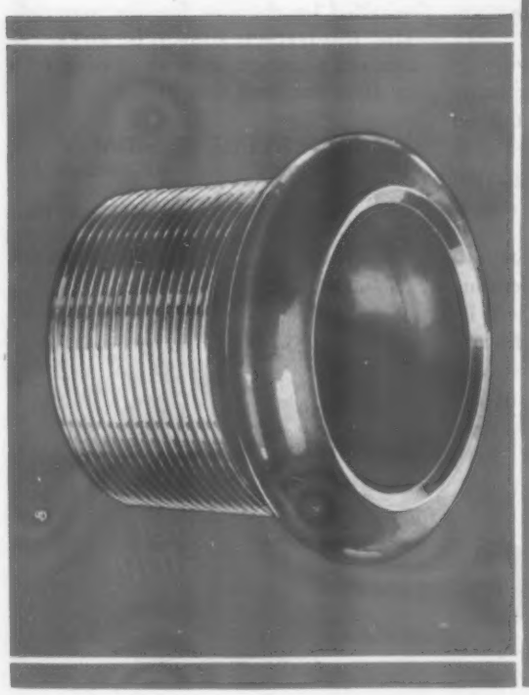
CENTRIFUGAL PUMPS FOR EVERY SERVICE

Say you saw it in The OIL WEEKLY



THE pipe manufacturer of today is uncompromising in his tests and inspection—he insists on a perfect product—but what is he doing to protect the result of this care and skill?

Colona Thread Protectors, put on at the mill—absolutely protect the threads



of pipe and couplings—they keep out all dirt and grease—they assure fast, tight joints.

This added service and protection is yours for the asking—why not save cleaning and rethreading time—why not insist on a perfect product?

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of Continuous Service *with* BYERS CASING

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This well was drilled in 1896, through a bed of No. 8 Cambridge coal, and has been producing a good grade of Pennsylvania grit oil. According to the foreman at the property, the casing in this territory is subject to corrosive action of sulphur water which drains down through the well.

When the casing, which is genuine Byers Wrought Iron, was pulled in October, 1928, it was possible to salvage all of the 4⅞" casing, amounting to 1400 feet, for use in drilling another well in the same vicinity.

The foreman, a man of practically thirty years of experience in the oil business in this territory, stated that he had never seen pipe under ground so long and still in such good shape.

Such records, however, are not unusual where Byers is used. Genuine wrought iron has fairly earned its reputation for longevity. The fibrous structure, the millions of microscopic slag filaments confer a degree of immunity to rust, vibration, shock, wear and tear which has never been equalled by cheaper ferrous material. The illustration shown is an unretouched photograph of the casing taken after the well was pulled.

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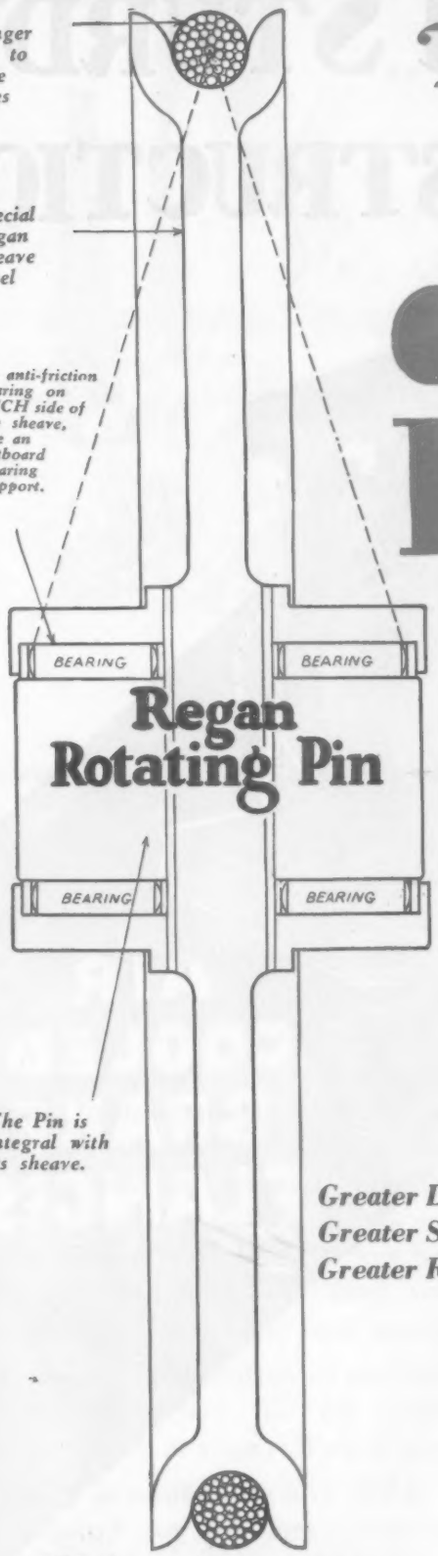
Special Regan Sheave Steel

An anti-friction bearing on EACH side of the sheave, like an outboard bearing support.



The Pin is integral with its sheave.

The only

Anti-friction dual-bearing Blocks

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Greater Life
Greater Speed
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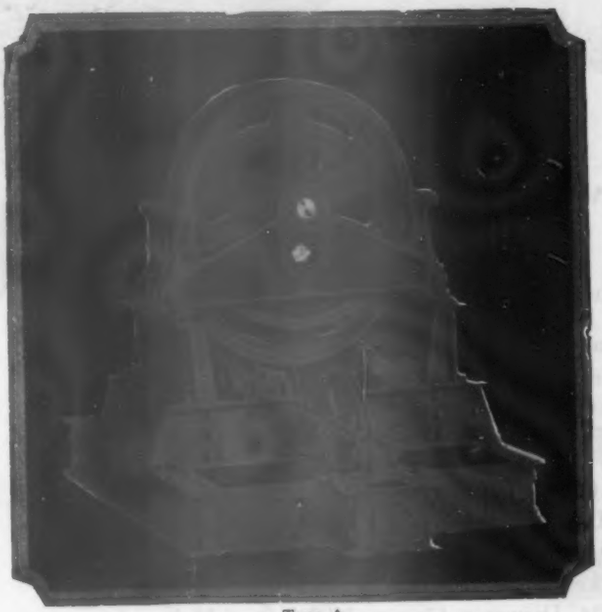

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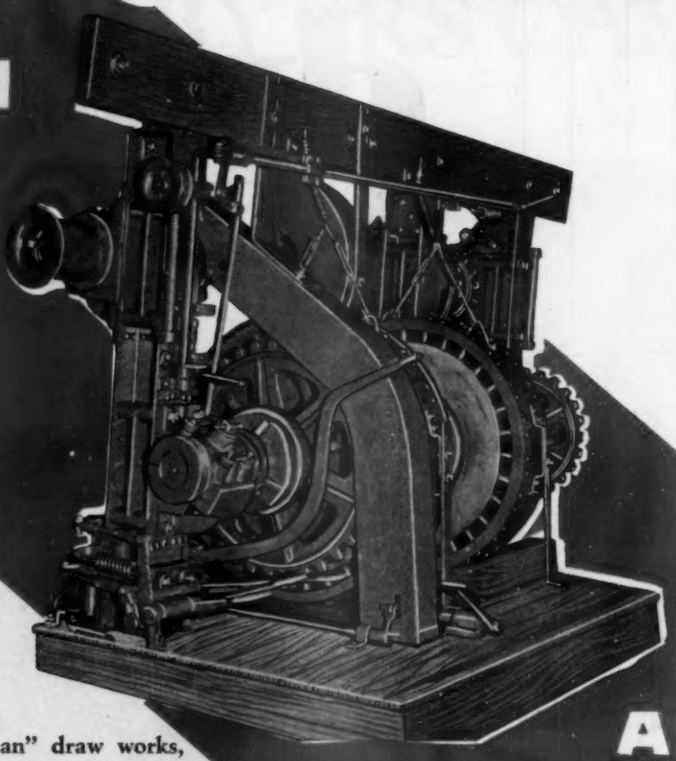
TO STAND THE GAFF OF ROUGH USAGE



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A study of its outstanding features reveals what hundreds of drillers have proven to themselves by actual use, viz. that a "Big Texan" will withstand the severest kind of treatment.

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BOYKIN MACHINERY & SUPPLY CO.
INCORPORATED
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"WICO EQUIPPED" *means* Perfect Ignition

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A trained organization of service representatives covers the oil territory. These men are at your call when needed.

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LINDE OXYGEN

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because Linde is a unit of Union Carbide and Carbon Corporation, whose vast resources are solidly behind the development of oxy-acetylene processes.

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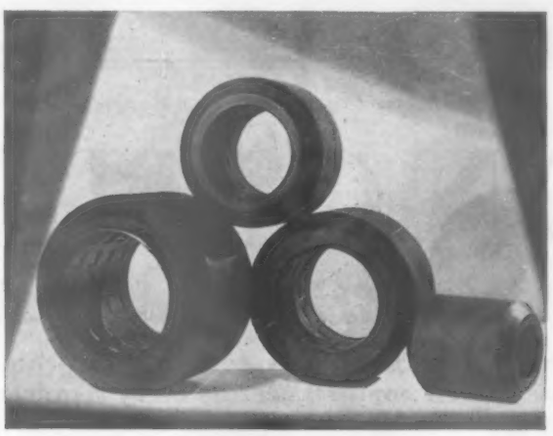

because

They are seamless, tear-resistant, hingeless, add no metal to the hole, cannot cause a fishing job. They outlast the drill pipe.

"Best bet yet"

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Stocks carried at Los Angeles, Santa Fe Springs, Ventura, Bakersfield, Coalinga, Long Beach, Tulsa, Houston, Wink and New York City.

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ECONOMICAL

in SPACE — in OPERATION

FOR compressor service of all kinds this compact, self-contained, high capacity Diesel or gas engine driven compressor fills every requirement. A large variety of interchangeable cylinder sizes can be supplied, adapting it to widely varying conditions or to work of an experimental nature such as encountered with the flowing of wells by compressed gas.

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CHICAGO PNEUMATIC

COMPRESSORS

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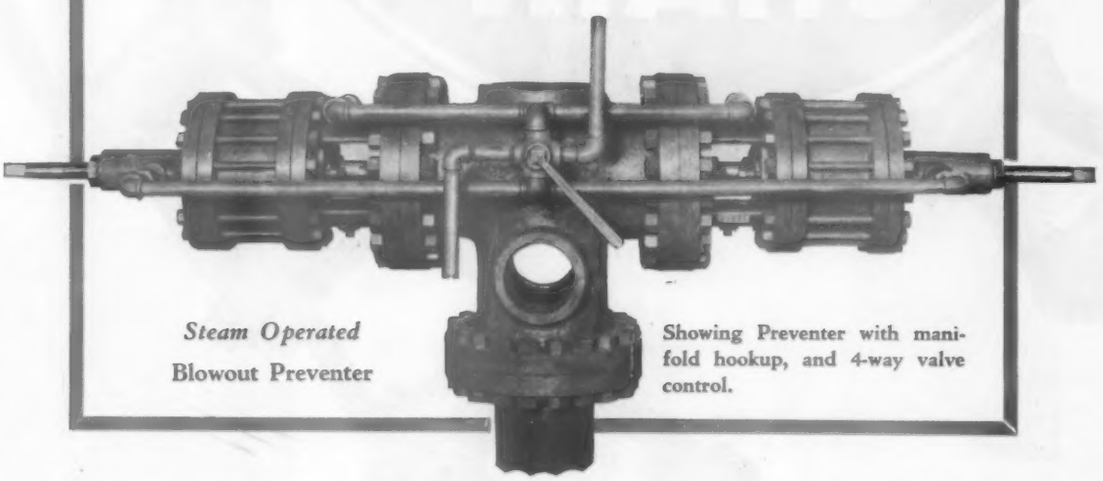
Will Tell You WHY THIS PREVENTER



Steam Operated
Blowout Preventer

Showing Preventer with manifold hookup, and 4-way valve control.

Will Keep Your Highest-Pressure Wells Under Control

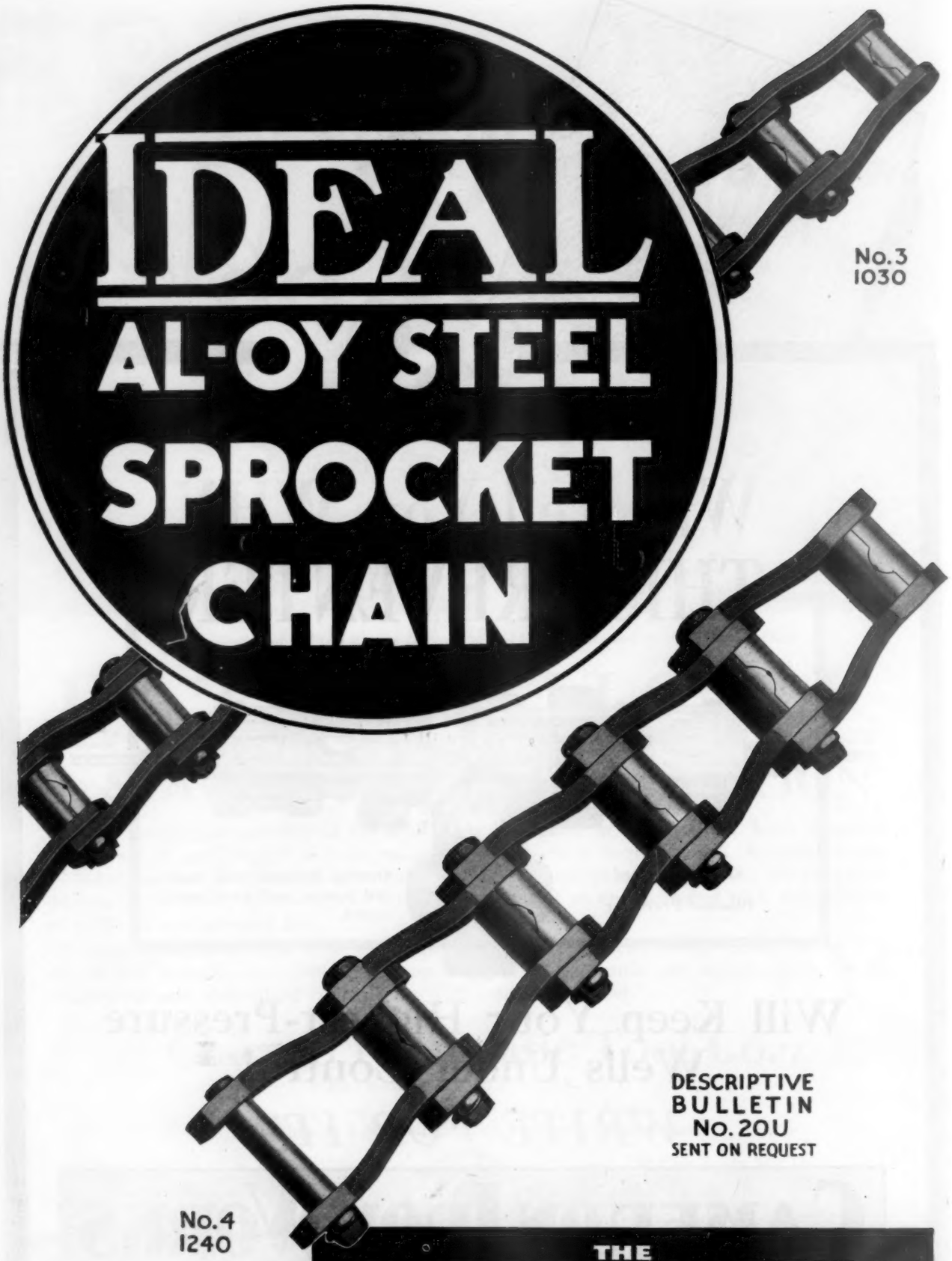
WRITE FOR IT!

CAMERON IRON WORKS

MFGRS. OF OIL WELL SUPPLIES & FISHING TOOLS

HOUSTON, TEXAS

IDEAL
AL-OY STEEL
SPROCKET
CHAIN



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THE
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is the result of using BREWSTER *Products*

A. P. I. Tool Joint

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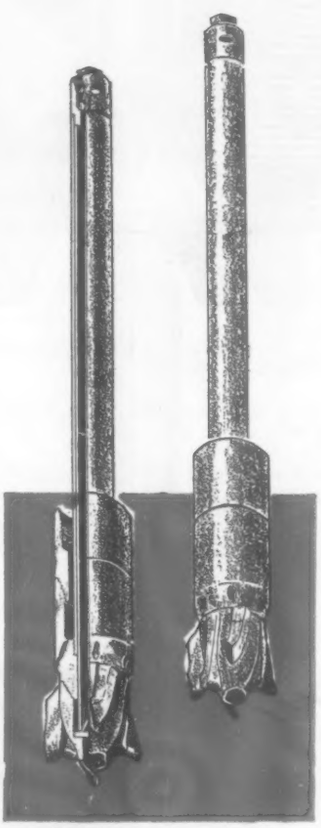

PERFECTION Core Barrel

Herbert Spencer said:

"There is a principle which is a bar against all information and which will keep a man in everlasting ignorance: that principle is contempt prior to investigation."

If we're right—you're wrong in not trying it. If we're wrong—you're right in not using it.

The Brewster COMPANY~INC.

SUCCESSORS TO OIL CITY IRON WORKS INC.

Shreveport, Louisiana

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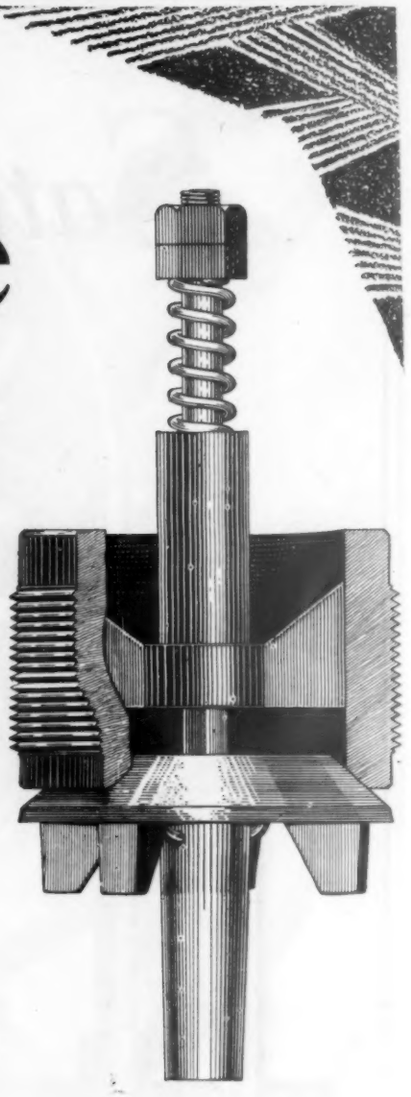
Simple and Dependable

That is Why the *New BAKER* Drill Pipe Float Valve is Deep in the Driller's Confidence—



Floating the drill pipe in, is the safe and economical way, and the Baker Drill Pipe Float Valve is the simplest, sturdiest and most dependable float valve on the market today.

A deeper and stronger cross member.

Nickel Chromium Valve Stem.

A thinner Valve Seat.

Larger passageway for the Circulation.

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2301 Commerce St., Houston, Texas

View of the complete assembly ready for insertion between the tool joints.

MAY 13 1929

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Member Audit Bureau of Circulations

VOLUME 53, NO. 8

MAY 10, 1929

Edited Weekly at Houston, Texas

SPENCER W. ROBINSON, EDITOR

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MAY 6-7-8-9:
American Gas Association, Natural Gas Department, Kansas City.

MAY 20-21:
National Oil Scouts Association of America, The Texas Hotel, Fort Worth, Texas.

MAY 21-22-23:
National Gasoline Association of America, Mayo Hotel, Tulsa, Oklahoma.

MAY 28-29:
American Petroleum Institute, Division of Development and Production Engineering, Mid-Continent District, Mayo Hotel, Tulsa, Oklahoma.

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A POSITIVE SEAL

THE operation of setting the "Oilwell" Lead Bottom Hole Packer is the same as with the regular "Oilwell" Bottom Hole Packer. The weight of the casing shears the rivets and forces the lead down on the shoulder between the packer and the wall.

"Oilwell" Lead Bottom Hole Packers assure a positive seal. The lead cannot be forced under the inner sleeve into the open hole to be a hazard when drilling.

"OILWELL" LEAD BOTTOM HOLE PACKER

926

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WORLD'S OLDEST AND LARGEST MANUFACTURERS OF OIL FIELD EQUIPMENT

Say you saw it in The OIL WEEKLY

Volume 53, No. 8 *May 10, 1929*

The OIL WEEKLY

A GULF PUBLISHING COMPANY PUBLICATION

Expansion In Long Pipe Lines

By J. H. POUND,

Mechanical Engineering Department, Rice Institute

ALMOST every structure is subject to changes in temperature. These changes are always accompanied by an alteration, in dimensions of the structure. Sometimes these changes cause excessive stresses and serious damage. Although long structures like pipe lines are often subject to such troubles, many men, even some of those actively engaged in pipe line work, seem to have rather indefinite ideas about the probable magnitude of these changes and the various possible remedies for the trouble. The following discussion is undertaken in the hope of clearing up a few of these uncertainties.

The change in length of a long body can be calculated by the use of the formula $e=LC(t_h-t_c)$, in which L is the length of the structure, C is a number known as the coefficient of linear expansion, t_h is the highest temperature and t_c is the coldest temperature to which the structure is subjected. Change in length e is given in the same unit of length used for L. The number C varies, of course, with the material of the body. From this farmula, it is evident that the amount of these changes in length depends on the size of the structure, its materials, and the amount of the temperature change.

Co-efficients of Expansion

If all materials expanded and contracted at the same rate, the damage from temperature changes would be much diminished, but the fact is that these rates vary considerably. For example, Mark's Mechanical Engineers Handbook gives the change per foot length per degree of Fahrenheit temperature change as:

Pine wood	0.000,0030
Soft O. H. Steel	0.000,0069
Granite	0.000,0048
Concrete	0.000,0080
Limestone	0.000,0014
Brick	0.000,0031

The unequal expansion of adjacent materials is constantly causing such troubles as cracked and weakened masonry, leaky concrete tanks, broken plaster, etc.

When the structure is of considerable size, the effect of even moderate temperature changes is very noticeable and sometimes quite destructive. A well-known example is found in the case of 'spread' railroad tracks exposed to hot sunlight, where the 'creeping' effects of alternate heating and cooling are frequently seen. This condition of creep is commonest where gravity helps prevent the structure from returning to its original condition when temperature moves back to its previous value.

Use of Anchorages

The slow movement of glaciers is due at least in part to such resisted temperature effects. During the warm hours of the day, the expansion of the ice, aided by the down-hill pull of gravity, moves the glacier down hill; but during the cool night hours, contraction and gravity together again produce the same effect, slowly but surely moving immense weights of ice and stone. The slow down-hill flow of sheet lead noticed on old-fashioned, steep-pitched roofs is also due to these same forces. In the construction of railways, a similar tendency of the steel to crawl down hill has caused considerable distortion and damage in incompletely ballasted sections; and in pipe lines laid down hill, even before the line is covered and completely cooled off, a serious tensile stress may result from easy down-hill expansion followed by resisted contraction. A possible remedy for this trouble would be to lay the line up hill, when gravity would resist expansion and by setting up compressive stresses would minimize tensile stresses resulting from creeping. Another possible remedy, generally used in connection with steel penstocks, is substantial anchorages.

Effect of Temperature

The condition most often determining the extent of contraction or expansion is temperature change. In pipe lines and railroads, the great length will cause large total expansion with small temperature rise, but that same great length also provides a certain amount of flexibility. But in pipe lines carrying hot fluids the temperature changes may be great, a fact which will produce large dimensional change in even a small length of material. Unless careful provision is made to neutralize their resulting dimensional changes, such large temperature changes result in cracked fittings, leaky valves, broken engine cylinders, and similar unpleas-

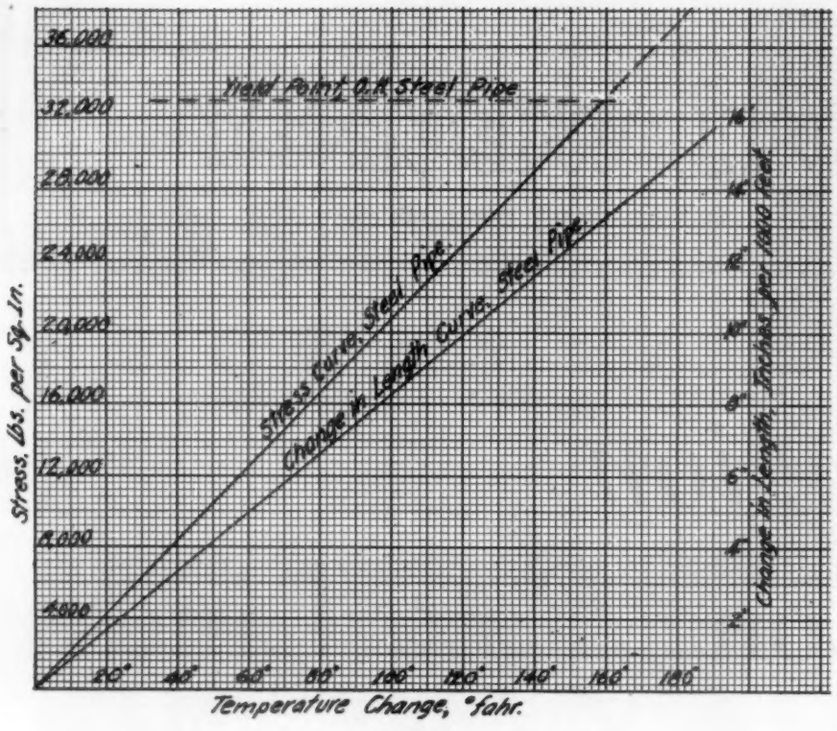

Yield Point O.H. Steel Pipe
Stress Curve, Steel Pipe
Change in Length Curve, Steel Pipe
Stress, Lbs. per Sq. In.
Change in Length, Inches per 1000 Feet
Temperature Change, °Fahr.

FIGURE 1

ant consequences only too well known to the power and the refinery engineer.

Stresses

If such changes in length are allowed to occur freely, as in the case of a length of pipe lying freely in a rack, no harm is done; but whenever motion is prevented, as by anchoring firmly each end of the pipe, the frustrated expansion or consrtaction developes a stress in the material. The amount of this stress can be calculated easily if the length of the member, its material, and the temperature rise is known, for it is always that stress which will produce the thermal expansion or contraction which is being prevented from occurring. Expressed as a formula, stress S in pounds per square inch to produce a given change e in a length L is Ee, or $e = \frac{S}{L}$, where $\frac{L}{L} \frac{L}{E}$

E is the stress in pounds per square inch required to produce a given change in length. This stress (known as the modulus of elasticity) varies for different materials, the values for a few common materials being: for steel 28,000,000 to 31,000,000 pounds per square inch of cross section, with 30,000,000 a common figure; for wrought iron, 26,000, to 29,000,000 pounds per square inch; for cast iron, 12,000,000 to 14,000,000 pounds per square inch.

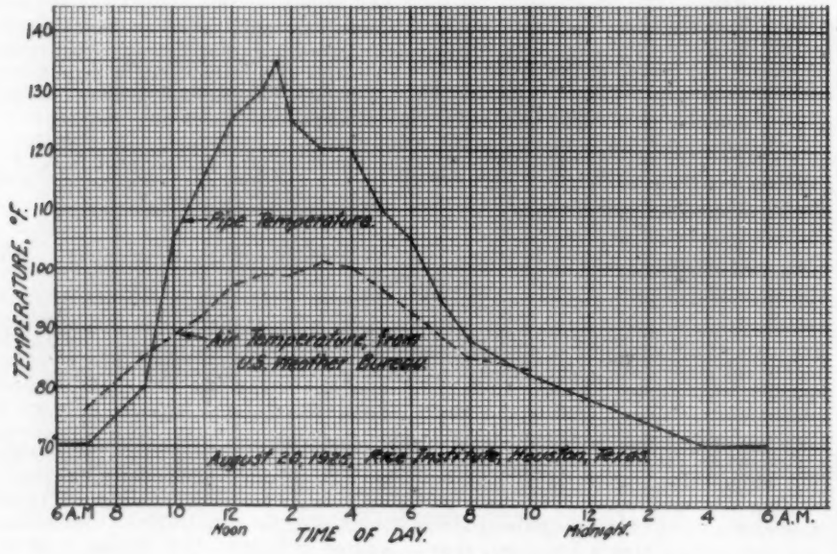

Pipe Temperature
Air Temperature from U.S. Weather Bureau
August 20 1925, Rice Institute, Houston, Texas
TEMPERATURE, °F.
TIME OF DAY.
6 A.M. 8 10 12 Noon 2 4 6 8 10 12 Midnight 2 4 6 A.M.

FIGURE 2

The formula and constants hold equally well for tension and compression, though of course they do not hold true after the stresses exceed the elastic limit of the material.

Formula for Stress

Two equations given above for expansion and for stress can be combined to give directly and very simply the stress in pounds per square inch due to the prevention of a free expansion of construction during a given temperature change. The first (or expansion) equation can be written $e = \frac{C}{L}$ $(t_h - t_c)$, and the second can be written $e = \frac{S}{E}$; hence $\frac{C}{L}(t_h - t_c) = \frac{S}{E}$, of $S = \frac{EC}{L}(t_h - t_c)$. If we substitute numerical values of E and C for steel pipe, we get this equation: $S = 207\ (t_h - t_c)$. Note that this equation says nothing about the length of structure involved. *If a pipe is prevented from contracting, a given temperature drop will produce the same tension in it, whether the pipe length be one foot or one mile.*

This stress-temperature relation is also shown graphically by the stress curve in Figure 1. Evidently, for pipe steel with an elastic limit of about 33,000 pounds per square inch, any temperature change exceeding about 160° F. will cause the pipe to receive a permanent deformation or 'set'—a permanent shortening and thickening in the case of a restrained expansion due to a temperature rise, and a permanent lengthening and thinning if the length cannot change during a temperature drop. If the pipe already carries stresses due to earth slip, poor support, or the like, this elastic limit will be exceeded with lower temperature changes than 160°. In any case, if the elastic limit is exceeded by tension, the pipe is thinned and permanently weakened, even if it is not pulled in two at once. It is conceivable that a repeated temperature fluctuation causing stresses above the elastic limit but well below the ultimate strength of the metal might eventually thin the pipe enough to cause its failure. This condition, however, is hardly likely to develop except in the case of the pipe line creeping down hill.

Preventing Stresses

For wrought iron, the constant 207 in the last equation would change to a figure between 172 and 192; for cast iron, the figure would lie between 70 and 84.

To prevent the development of serious stresses, the engineer can do either or both of two things: he can prevent the large change in temperature which is the primary cause of the trouble, or he can anticipate the changes in dimension and can force them to proceed in a relatively harmless manner. He cannot meet the situation by using extra thick metal in the walls of his pipe, for each square inch of cross section added means a

corresponding amount of metal added to undergo expansion.

The first remedy suggested above can be applied to a certain extent in practice. In the case of steel pipe lines, temperature stresses are due chiefly to temperature changes occurring while the line is being laid. If the line could be laid at the temperature at which it is to be used, a minimum of stress and movement would result. To secure this end, one must first answer the questions, What is the ordinary service temperature, and how can the pipe be laid at that temperature?

Since the specific heat of oil and especially that of gas are low figures, it would seem reasonable that the temperature of the buried pipe should be approximately that of the earth surrounding it, unless oil heaters or the like are used. This earth temperature depends on depth and on atmospheric conditions, especially on depth. Data on this subject for United States conditions seems scarce, though it is valuable for use in calculating oil and gas flows as well as in pipe expansion problems.

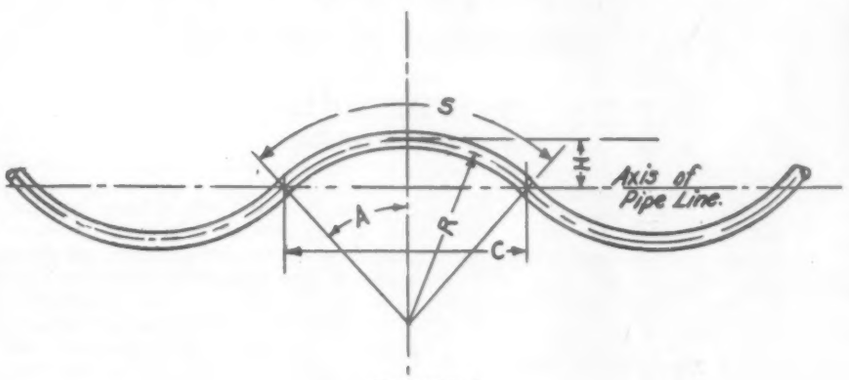


FIGURE 3

Experiments

Tests by a major pipe line company in the Panhandle of Texas, covering a good many months and made at depths of 18, 24, and 36 inches show a rough average, taken by eye from the curves, of 65°. As would be expected, the earth temperatures at all depths fluctuate less than air temperatures, the earth temperature lags behind the air temperature, and in winter the earth temperatures are above the air temperatures and in summer they are below air temperatures. But the pipe line engineer is more interested in maximum and minimum earth temperatures than in averages, and these observations showed a maximum earth temperature of 85° at 24 inch depth and of 82° at 36 inch on a day with air temperature of 87½°. The minimum earth temperature of 37° was associated with an air temperature of 16°, giving a total yearly variation of only 48° F. Such a change would produce a fluctuating stress of not more than 10,000 per square inch in mild steel pipe, once the pipe is buried and has reached earth temperature. F. M. Lege Jr., president of the Magnolia Gas Company, has stated also (Jnl. American Welding Society, 1927) that in East Texas the temperature range in gas lines (depth not stated) is between 85° and 35°.

Temperatures in Gas Lines

The Bureau of Mines has reported (Reports of Investigations No. 2771, E. L. Rawlins) some very interesting temperature measurements of gas flowing in a line buried 18 inches deep, presumably in Oklahoma. Over a year's time, maximum and minimum temperatures of 83° and 33° F. were found, with a fluctuation of 50°. In an adjacent unburied line, maximum and minimum gas temperatures of 139° and—1° F. were reported in August and December 1924 respectively.

Very probably, pipe to carry gas or unheated oil will reach its maximum temperature while lying in the sunlight during the process of laying, rather than while resting in a covered trench. If this be true, the maximum temperature in the buried pipe is of no great interest in length-change calculations, though of value for flow calculations. Unfortunately, this exposed-pipe temperature is another piece of data seldom met in print. One learns through the newspaper of sidewalks, street car rails, and the like which are hot enough to fry eggs, and travelers through Death Valley describe successful efforts to stew prunes exposed to the sun; but for various reasons, doubtless excellent ones, such tales are never accompanied by certified thermometer readings.

Summer Variations

To come a little nearer the truth, the writer has measured by a recording thermometer whose bulb was well protected from solar heat the temperature of the inside surface of a length of well-rusted eight inch extra strong pipe lying in a shadeless part of the Rice Institute campus near Houston. On no occasion during two summers did the temperature shown exceed 140° F., this maximum being secured on a bright day with an air temperature of 102°. On a clear summer day (see Figure 2), the minimum is usually reached about six A. M. In general, the maximum is reached shortly after noon and is maintained pretty well for three or four hours; then a gradual drop ends with a temperature of perhaps 70°, giving a drop of about 70°. This daily fluctuation is probably greater than the yearly drop in a buried line.

The stress curve of Figure 1 shows that such a variation, if not allowed to cause free movement, might develop a daily stress variation of 14,500 pounds per square inch in unburied steel pipe lines. The expansion for this temperature range would be 5¾ inches per 1000 feet.

Winter Contraction

If pipe laid without expansion provision at a summer maximum of 140° were cooled during the winter to the minimum of 37° showed by the Panhandle test, the resulting yearly temperature drop of 103° would set up a stress of about 21,000 pounds per square inch. Using the Bureau of Mines data, if a pipe line is assumed as laid in August at the maximum unburied line temperature of 139° and if in December the pipe reaches its minimum buried temperature of 33°, its contraction will correspond to a drop of 106°. These two pieces of data seem to indicate that a line laid in summer in the Southwest can be expected to undergo a temperature change of approximately 100° F.

The maximum exposed-pipe temperature, like the minimum earth temperature, would of course be affected seriously by latitude, rains, the prevalence of shade from clouds or vegetation, and general conditions; so that a figure of 100° maximum temperature change would certainly not be correct for all conditions.

To minimize the maximum temperature of the pipe, two procedures have been suggested: first, cooling the pipe by shading it or by filling it with water before covering it, and second, lowering the pipe and backfilling the ditch during the hours when the lower pipe temperatures are experienced. Each proposed remedy has quite evident objections, tho the last one is often attempted.

Flexibility Allowance

Since the pipe line temperature variation cannot be controlled readily, the usual procedure is to try to allow sufficient flexibility in the line to prevent development of serious temperature stress. Pipe movement is especially undesirable in a painted or coated line; but even in this case, freedom for contraction is the ordinary stress preventive. Such freedom can be secured by using certain pipe couplings, but the commonest method in oil practice is probably the provision of 'slack' by laying the pipe in sinuous shape in its ditch. Since the line is usually laid hot, is subject to a prompt contraction in the ditch, and probably never ex-

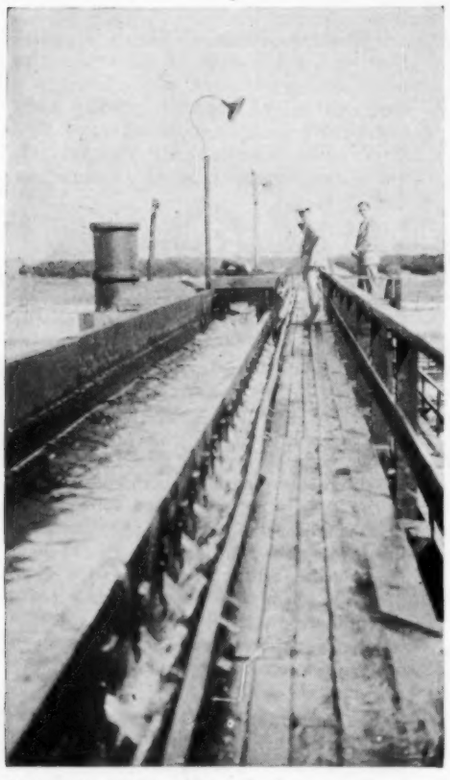
(Continued on page 101)

Waste Water Cleaned at Santa Fe Springs

With Minimum Cost to Producers

Failure of individual operators to meet requirements of authorities in preventing ocean pollution results in formation of cooperative plan which works to satisfaction of all concerned

By BRAD MILLS
Staff Representative



Waste water coming into trough on top of aerator

INCORPORATING purely mechanical means to remove the oil from more than 40,000 barrels of waste water daily, the plant of the Waste Water disposal Company at Santa Fe Springs stands out as a genuine achievement to engineering skill, and satisfactorily solves a problem of several years' standing.

Although incorporated, the company is composed of producers in the Santa Fe Spring, Montebello, Whittier and West Coyote fields and is a non-profit organization. The plant is a direct result of the failure of individual efforts of operators to dispose of their waste water from these fields. These attempts, some of which were more or less feeble, were the cause of widespread complaints from authorities who claimed that the waste water from Los Angeles Basin fields was contaminating ocean waters and harming vegetation along the route to final disposition. The success of a cooperative plant in the Long Beach field had been so outstanding that a similar undertaking at Santa Fe Springs seemed the most logical means of meeting a menacing situation.

Waste water from the fields involved contains a high percentage of salt and an average of nearly one per cent. of oil. County and state officials carefully safeguard the fresh water streams, while both government and state authorities will not permit the raw water to be dumped into the Pacific Ocean.

Main Cleaning Plant

The main cleaning plant of the system is 100 feet wide and 160 feet long and consists of an aerator and distributing trough tower, a series of compartments, riffles, and a filtering system. The rectangular layout is made almost exclusively of concrete and was designed to operate by gravity.

The mechanical cleaning plant resembles a concrete box which has been divided into many compartments. A partition or division, running the full length of the great concrete box, divides it into two units, each of which does exactly the same amount of work. These have been designated Unit No. 1 and Unit No. 2.

Each unit is divided into a series of compartments, each designed to work toward separating oil from the water. The first compartments are designed to remove the sediment and sludge, along with nearly all of the oil, while the series of compartments following the riffles are intended to isolate the oil that has not been separated in the first or major compartments. Following the long series of outer compartments is the filtering compartment, which finally catches the oil that has escaped the two major processes.

The flow of the waste water and oil from one end of the cleaning plant makes a very interesting study. All of the field lines empty into an 18-inch vitreous feed line, which leads into the top of the aerator. A trough or sluice box first receives the waste, which is released through a series of orifices running the full length of the trough. The waste water falls down on and through a series of lattices, which comprise the aerator. It then strikes the slanting end of the plant, at the bottom of which is a concrete baffle or partition which catches most of the mud. The water flows over this baffle into a large compartment for further separation of sediment, sludge and oil.

Each unit has this large compartment, which slopes from all sides to two central sludge outlets. The one compartment or sludge basin is divided on the bottom into two rectangular slopes. Two curtain walls, under which the water maintains a constant flow, trap the oil. About 95 per cent. of the oil is removed in these sludge basins; it separates and rises to the top, where it is skimmed off through swinging pipe outlets. The sediment and sand settles at the lowest point of the sludge pits and directly around outlet valves.

Leaving the sludge pits, the water flows over a series of riffles, which tend to break up the oil globules still held in suspension. The six riffles, or falls, have a combined drop of only 14 inches but the agitation works wonders.

After passing over the riffles, the water runs through five compartments, the division between each being nothing more than curtain walls. As the water passes from one compartment to another, flowing under the curtain walls, the oil rises to the top and is skimmed off from each division.

From the last of the five compart-

ments, the water flows under a curtain wall and over a baffle plate into a narrow compartment filled with excelisior. The last baffle is slightly lower than the level of the top of the series of curtain walls in the five compartments, allowing the water to pour over into the compartment filled with excelsior before it has a chance of overflowing the curtain walls. The excelsior acts as a filter, catching the oil which has not been trapped by the compartments. The water filters through the excelsior, rises over a baffle and is sent on its way to the ocean. The last baffle is lower than any of the preceding curtain walls or baffles and accounts for the constant level in the plant. About 2500 pounds of excelsior is required. This is cleaned monthly and may be reclaimed by washing in distillate.

All through the plant, construction has been planned to agitate the water where possible. The extremely slow motion of the liquid through the compartments adds to the difficulty of a swirling motion, but the time element aids the separation.

When the waste water enters the plant, it contains about one per cent. of oil. When it leaves the plant for the ocean, it contains about 20 parts per million of oil in solution. The government allows a maximum of 50 parts per million, but the figure is never reached. On warm days, the amount of oil has been reduced to 10 parts per million. A weekly chemical analysis is made, in which the oil in the water is extracted by an iron compound, the oil removed from the iron compound by ether, the ether evaporated and the remaining oil weighed and the part per million determined by proportion. The water received is salty, containing about one-fourth as much salt as ocean water.

The reserve or emergency storage basin is 300 feet wide and 500 feet long and holds 180,000 barrels. It is lined with asphalt and was built to hold the overflow in case the ocean line breaks or clogs.

Large mud and oil pits have been built to handle the output from day to day. One large mud pit was built with the expectation that it would not be filled under one year. It was completely filled in eight days.

The total cost of the plant and auxiliary reservoirs, as well as the pipe line to the ocean was slightly less than $500,000.

Some salient facts concerning the construction and operation of the plant and pipe lines follow:

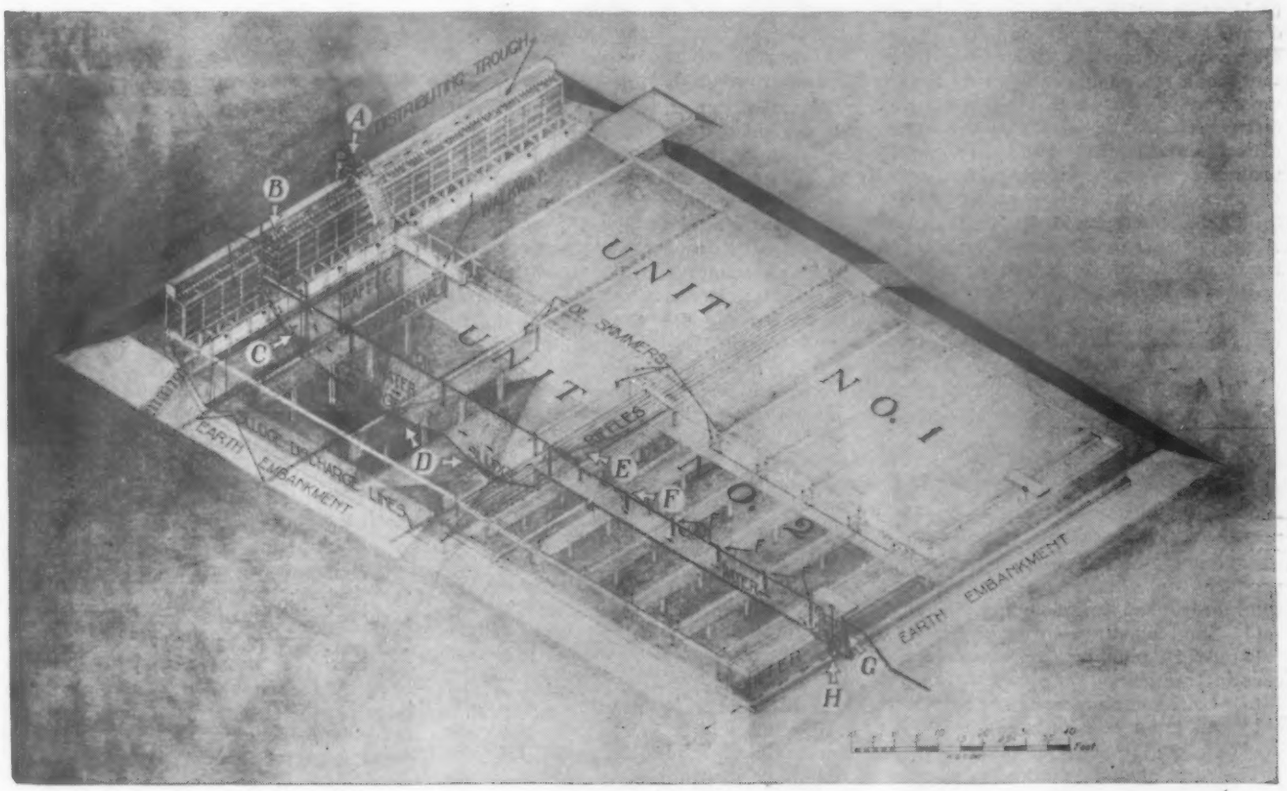
Fields served, Santa Fe Springs, Montebello, Whittier and West Coyote; number of companies served, 25; number of connections leading to the plant, 50; length of pipe line, 28 miles; size of pipe lines, four to 24 inches; water handled daily, 42,000 barrels; uncleaned oil reclaimed daily, 350 barrels; oil used for road purposes; selling price, 40 cents per barrel; cost of operation, $40,000 annually; cost per barrel for handling, $0.003; time water is retained in plant, six hours; plant started operation February 1, 1929; area of plant and basins, six acres.

Operators pay on the basis of water contributed and the cost of facilities used. Leases located near the plant participate at a much lower rate than those located a few miles away. This is accounted for by the difference in cost of building and maintaining a gathering line to the remote leases.

On a more settled basis of operation, Santa Fe Springs is expected to furnish about 30,000 barrels daily, Montebello 10,000 barrels and Coyote 4,000 barrels. Santa Fe Springs is now furnishing nearly all of the waste water.

The pipe line to the Pacific Ocean, though not an integral part of the plant, is 82,000 feet long and was laid with vitreous pipe, ranging from 16 inches to 24 inches in diameter. It has never caused any trouble. The joints are cemented with Petrolastic. At high tide, the water backs up into the line, but vents have been installed to relieve the air caused by the opposing pressures.

The use of waste water disposal systems is growing in California and it is believed that idea will soon become popular in other states, where townlot operations are common, or where the danger from polluting streams is apparent.



Sketch of the most modern oil separating plant, built by the Santa Fe Springs Waste Water Disposal Company. Each unit, only 50 feet wide and 160 feet long, is expected to clean 30,000 barrels of waste water every 24 hours. The oil and water emulsion enters at "A" and is distributed through aerator "B" to break emulsion. The heavy mud and sand is caught at the preliminary sedimentation chamber "C." The water then flows over the baffle into a sludge basin "D" where the remainder of the sand and mud is removed. At this point about 95 per cent. of the oil is collected. The remaining oil passes with the water over the baffles and riffles "E" for a second aeration, after which it flows under the curtain walls "F," the oil rising to the surface being caught back of the walls. The water is then passed through filters "G" to insure the complete removal of any remaining particles of oil before discharging into the outlet line "H"

Paper Presented at the Convention of the Natural Gas Department, American Gas Association

Methods of Covering Pipe to PREVENT CORROSION

By WILLIAM MOELLER, JR.
Midway Gas Company, Los Angeles, California

IN discussing this subject, primary consideration will be given to methods rather than materials, and furthermore, the subject will be treated with particular reference to transmission line construction rather than the installation of distribution mains and service lines.

Materials generally used as protective coatings for underground pipes are: (1) coal tar products; (2) refined and natural asphalts; (3) grease; (4) asphalt emulsions.

No attempt will be made to discuss the relative merits of these various materials, A canvass of the gas and petroleum industry would, no doubt, indicate both good and poor results for all or any materials. Since it appears that coal tar or asphalt products are most generally used in the industry this discussion will be based on the application and use of these materials as protective covering for pipe lines.

Assuming that these materials are satisfactory, the problem becomes one of proper application to the pipe so as to form a coating thereon that will protect the steel. The first essential is that the coating must adhere firmly to the pipe, that is, there must be a perfect bond between pipe and coating. Failure to secure a proper bond is responsible for most of the failures of the covering.

Cleaning Pipe

The surface of the pipe must be clean and dry. This is of sufficient importance to justify the use of the most efficient equipment, methods, and inspection to produce the desired results. Methods commonly used for cleaning pipe are:

(1) Sand blasting.

(2) Acid pickling or commercial caustic treatment.

(3) Mechanical means, such as machine or hand brushing and hammering, or a combination of same.

The sand blasting method is now being used quite successfully, and produces a surface which is clean, dry and slightly rough—a condition most favorable to secure the proper bond between the steel and the coating. This method is highly recommended and can be readily used at a central cleaning plant, but may be limited in field use until more suitable equipment is available.

The acid pickling, or commercial caustic method, produces a very satisfactory surface but is applicable for use in a central treating plant and requires careful washing and subsequent drying. It is at present not adapted to field use.

The use of mechanical means for cleaning pipe, either hand or machine operated, as now generally used in field practice, does not, as a rule, produce the most satisfactory surface. The principal fault is that the surface is not always clean and the tendency is to polish the surface, both conditions being unfavorable to the proper bonding of the coating to the pipe.

The practice of applying an oil protective coating to the pipe at the pipe mills, prior to the shipment of the pipe, is not recommended because, unless completely removed, it produces a surface that is most unfavorable to the securing of a proper bond between steel and subsequent coating to be applied. The better practice is to thoroughly clean the pipe at the mill, either by sand blasting or pickling, and to apply a priming coat of suitable material at the mill before the pipe is shipped. The nature of the priming coat to be so applied at the mill must necessarily be governed by the kind of material that will subsequently be used as the protective covering for the pipe line.

This method is recommended because it affords ideal conditions for doing the work. It permits the use of the best methods for cleaning and preparing the surface and for applying the priming coat. It also permits thorough inspection of the work.

A satisfactory coating or covering is one which will not be destroyed by the various elements which cause the corrosion or destruction of iron pipe underground, or which may be present in the soil. If such a coating could be applied to the pipe with assurance that it would bond effectively and remain permanently on the pipe, and form an impervious covering, the job would be considered ideal.

So far as bonding or adhesion properties are concerned, this depends to a large extent on the careful preparation of the pipe surface. Whether or not a coating is impervious when applied depends largely on the inherent qualities of the material used and to some extent on the method of application. It is assumed that no coal tar or asphalt product such as is not generally used for this purpose is absolutely impervious, and to secure the greatest degree of imperviousness, the thickness of the covering is built up, generally several coatings are applied, one on the other.

After the pipe surface is properly cleaned, the initial coating should be the so-called "priming coat," which is usually applied cold. It serves to secure a good bond with the pipe and the greatest care should be exercised in its application. The consistency of the material used for the priming coat is such as to permit the application of a thin coat, and several methods are used, the most common and perhaps the best being by use of hand brushes. Brushing permits of the thorough application of a uniform coating.

So-called air brushes are also effectively used, but care should be exercised to assure that moisture is removed from the air, and that the coating is uniformly applied.

Application of Covering

It is of great importance that the priming coat be allowed to thoroughly dry before the application of any subsequent coating.

These subsequent coatings may be applied either cold or it may be necessary to heat them to render them sufficiently liquid, depending upon the nature of the material used. All other things being equal, the cold application is preferable because it can be applied more conveniently, because it reduces the fire hazard during construction, because there is no possibility of destroying or changing the nature of the material due to overheating, and because we can be more certain of the final results.

One objection to the use of cold paint is that is necessarily contains a

(Continued on page 104)

Paper Presented at the Convention of the Natural Gas Department, American Gas Association

Some PIPE LINE *and Transmission* PROBLEMS

By JOHN C. DIEHL
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THE subject of transmission lines for gas is becoming more and more important each year as the number, length, and size of lines have been increased until now, lines 500 miles long and 22 inches in diameter are being constructed for natural gas and some lines as large as 24 inches in diameter have been proposed.

In the manufactured gas industry when the number of small plants in towns within 50 miles of one another are owned or operated by one company, the smaller plants are being abandoned in favor of a more economical large central plant with a high-pressure system of lines to the outlying communities.

The manufactured gas and natural gas industries are becoming more and more closely allied. It is expected that in the not far distant future practically all of the gas lines will be linked together in such a way that it will be possible to transmit manufactured gas from locations where gas can be made close to coal mines or oil fields, at a low cost of production, and furnish this gas to other localities wherever supplies of raw fuel are not available, manufactured gas will be delivered to natural gas communities to meet peak load demands or natural gas to meet the peak load demands in the manufactured gas lines.

Many large gas companies are looking forward to the time when the gas will be used exculsively as a domestic fuel in the larger cities, and most of the coal which is mined will be converted into coke and gas, the heat being utilized for generating electricity and the gas being transmitted to the cities for heating, cooking and industrial purposes.

Three commonly recurring problems will be discussed in this paper. One dealing with the economics of construction, one with the pulsation effect on meters, and the last on the effect of atmospheric pressure on quantity or price of gas.

The economics of construction, while not at all simple, usually can be solved approximately by pipe line capacity tables which have been published from time to time. In order to form a quick estimate of an economical type of line, a few additional formulas are proposed.

In the construction of a line there are some requirements which are fixed. It is seldom that there is much doubt about the length. However, there is an element of doubt about the quantity of gas which is to be transmitted through the line. The quantity of course refers to the maximum capacity, which depends upon the present as well as the probable future requirements. Frequently it is advisable to build a line sufficiently large to take care of the requirements for the first couple of years, and if additional demand is created, to supplement the original layout by additional compressor stations and loops at strategic points along the line. If it is assumed that the maximum quantity or capacity of the line is fixed and the length is fixed, the following formulas give the weight of the line in tons:

$$W = \frac{Q\,L^{1.5}}{746{,}000_d\ 0.667} = \frac{Q^{0.75}\,L^{1.875}\,P^{0.25}}{139{,}000}$$

W = weight in tons of 2000 pounds.
Q = quantity of gas in cubic feet a day at 14.65 pounds absolute.
L = length of sections in miles.
P = page pressure in pounds at inlet.
D = diameter of pipe in inches.

These formulas are based upon the assumption of an approximation that the outlet or down-stream pressure at the end of the line will be one-third of the inlet pressure.

The formulas express the weight assuming the same thickness for the entire line. For sake of simplicity the working tensile strength of the pipe is assumed to be 12,000 pounds per square inch. If the working strength is to be greater, the weight is reduced accordingly. It is also assumed that the pipe of any desired thickness may be obtained from the mills. Although this is not true, the general results obtained will be relative and indicate tendencies produced by the various factors.

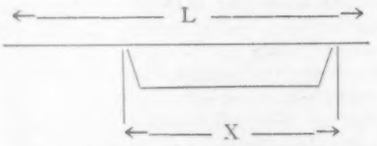
In these formulas it will be noted that if the length and capacity are known, the weight can be determined from the diameter of the line. It is readily seen that as the diameter of the line is increased or the inlet pressure is decreased, the weight will be decreased. Assuming that the total length of the line is given, it will be noted that if the line is divided so that compressor stations are used at several points, the weight of pipe required diminishes as the number of compressor stations increase. However, as the number of compressor stations increase, the cost of the compressor stations increases; consequently there is a limit to the economical number of compressor stations, the number being such that the cost of compressor stations and the cost of the lines is a minimum. In fact the number of compressor stations should be less than that required in order to obtain a minimum cost of line and compressor stations, for the reason that there is a continuous fixed charge for operating compressor stations.

The length of loops required for increasing the capacity of a line can be solved by the existing pipe line capacity tables. A short method of solving some of these problems is desirable. The length of the loop required to increase the capacity may be solved by the following formula:

$$X = \left(\frac{1 - \left(\frac{Q}{Q_n} \right)^2}{1 - \left(\frac{C_m}{C_m + C_l} \right)^2} \right) L$$

in which

X = length of loop in miles.
Q = capacity of line in cubic feet a day.
Q_n = proposed capacity after loop is installed.
C_m = coefficient of one mile of main opposite the loop.
C_l = coefficient of one mile of loop line.
L = length of line in equivalent miles of main opposite the loop.



Pipe-Line Coefficient

C in thousands of cubic feet in 24 hours; base pressure, 14.65 pounds absolute (four ounces); base and flowing temperature, 60 degrees F.; specific gravity, 0.60; for one mile in length.

Normal Size inches	Internal diameter inches	Coefficient for one mile pipe
2	2.067	6.04
4	4.026	35.73
6	6.065	106.56
8	7.981	221.56
10	10.020	406.44
12	12.00	657.4
14	13.25	856.3
16	15.25	1245.7
18	17.25	1730.3
20	19.25	2318.3

Example: Determine length of 16-inch loop required to increase the capacity of 86 miles of 18-inch line by 15 per cent. Then, $Q_n = 1.15Q$, $C_m = 1{,}730.3$, $C_l = 1{,}245.7$, and $L = 86$.

$$X = \left\{ \frac{1 - \left(\frac{Q}{Q_n}\right)^2}{1 - \left(\frac{C_m}{C_m + C_l}\right)^2} \right\}$$

$$L = \left\{ \frac{1 - \left(\frac{Q}{1.15Q}\right)^2}{1 - \left(\frac{1{,}730.3}{1{,}730.3 \div 1{,}245.7}\right)^2} \right\} 86 = 31.6$$

$X = 31.6$

One of the transmission line problems which has proved to be most annoying is how can gas be measured accurately near to compressor stations.

Meters which depend on velocity or differences in pressures are nearly always used for measurement of gas in transmission lines and since it is probable that the measurement close to compressor stations may be affected by the pulsation, the usual instruction states that the meter must be installed as far as possible from the source of pulsation. This instruction does not satisfy the question as to how far away the meter should be installed so that it will not be affected, and if it must be installed close to the station, what must be done to make it possible to measure the gas accurately.

A survey of the literature on the subject indicates that the results obtained from orifice meters subject to pulsation are most generally high, and that the differential produced by the pulsation flow is greater than that which would be produced by the same rate of flow if the pulsation effect were absent.

Some data which has been published indicates that it has been possible to obtain measurement of pulsating flow by difference of the calculated results from two orifice meters, one meter being installed in a dead end line. Later tests have shown that although satisfactory results were obtained in a large number of tests on a certain layout, this method could not be generally applied. However, the relative results obtained from these tests indicate that it is possible to determine whether the pulsation effect exists and if it will affect the measurement of orifice meters. The conclusion formed was: if the pulsation is affecting the measurement through the orifice it will produce a differential reading on a differential gage attached to taps one on each side of an orifice installed in a dead end line connected to the main at the orifice. In other words, a differential reading will be produced by pulsation at an orifice without a flow. Furthermore, the tests indicated that the reading would increase as the size of the orifice in the dead end line is decreased. If a by-pass is installed around the main line meter, it is possible to create a temporary dead end line at the meter by opening the by-pass and closing the main line gate on the down-stream side of the meter. The main line orifice is replaced by a smaller orifice about one-fourth of the diameter of the measuring orifice, and the meter is placed in service. The py-pass gate is partially closed so that the differential across the gate is equal to the maximum differential at the measuring orifice when in service. If the differential reading at the meter in this temporary dead end line in which there is no flow is zero, it is safe to conclude that the readings obtained from the meter in service are not affected by pulsation. If substantial readings are obtained by the meter, it is very probable that pulsation is affecting the readings when measuring in the usual manner by the orifice.

The next problem is how can the pulsation effect at the meter be eliminated. In an article by Mr. Hodgson in "Transactions of the American Society of Mechanical Engineers" 1929, a formula and diagram are given which indicate that the percentage error varies as the absolute pressure and inversely as the pressure loss multiplied by the square of the volume of the line between the source of pulsation and the meter, also inversely as the square of the number of pulsations per minute. This indicates that if the pressure loss is increased, the effect can be reduced and reduced very rapidly if the volume is increased. Other writers have obtained similar results. It has been the writer's experience that the ratio of the diameter of the orifice to the diameter of the pipe has a material effect on this problem.

If the preceding statements represent the general effect of pulsation on orifice meters, it may be stated that if the pressure loss between the meter and the source of pulsation multiplied by the square of the volume between the same points is greater than some constant multiplied by the absolute pressure divided by the square of the revolutions per minute, the effect of pulsation may be reduced until it is negligible.

The following formula indicates the conditions required to reduce the effect until it is negligible:

$$HV^2 \text{ must be greater than} \frac{K}{R^2} \frac{PD^2}{d^2}$$

H = pressure loss in pounds between the meter and source of pulsation.
V = volume of line in cubic feet between the meter and source of pulsation.
K = constant depending upon the characteristics of the layout.
P = pressure of the gas in pounds per square inch absolute.
R = revolutions per minute.
D = diameter of the pipe line.
d = diameter of the orifice.

From this formula it is noted that a large drop in pressure may not be effective if the volume is small and likewise a large volume may not be effective if the resistance is low. It will be noted also that as the revolutions per minute increase, the effect due to pulsation is reduced as the square of the speed. Consequently, if two compressors are used instead of one and the compressors are out of step, the effect is one-fourth of what it would be if only one compressor is used, or if the two compressors were in step. If ten compressors are used, the effect is one per cent. of what it would be if one compressor is used.

One effect of pulsation which can be immediately noticed by referring to the formula is that this effect does not depend directly upon the rate of flow. Of course, the pressure loss is a function of the rate of flow, and if the compressor is operating and there is no gas passing through the line a pulsation effect can be produced regardless of the fittings or capacity which is introduced between the meter and compressors as the resistance loss is practically eliminated.

In a test of orifice meters close to compressor stations, one meter was installed in the inlet and three orifice meters were installed on the discharge line 700 feet from the station. The meter at the inlet measured air at approximately atmospheric pressure. The first and second meters on the discharge line were installed in two-inch and four-inch lines measuring air at line pressure which was varied from 100 pounds to 400 pounds by 50-pound steps. The third meter on the outlet measured the air again at or near atmospheric pressure. The readings from the meter at low pressure on the discharge line were always less than the readings at the intake meter and the difference between them increased as the pressure increased, indicating a probable leakage. The results from the meters at high pressure were consistent with the low pressure meter at pressures below 200 pounds. However, as the pressure increased from 200 pounds to 400 pounds, the meters at high pressure on the outlet gave results which became increasingly greater as the pressure increased.

After the initial test a large volume tank approximately 10 feet long and eight feet in diameter was installed in parallel with the line between the inlet meter and the compressor. The tank was installed in such a manner that the gas could be passed through the line without entering the tank, the tank could be used as a surge tank or all of the air could be passed through the tank. A high pressure tank 30 inches in diameter and eight feet long was placed in the by-pass of the outlet line between the compressor and two high pressure meters. The piping layout at this tank was similar to that at the inlet tank. The valve which was installed on the discharge line opposite the high pressure tank between the station and the high pressure meters was used to produce additional resistance in the line when desired.

In order to provide an additional check or an arbitrary reference for measuring the air passing out of the line, a critical flow orifice was installed

at the outlet end of the line replacing the low pressure meter. The critical flow orifice was a most satisfactory reference for measurement in this particular case for the reason that the quantity which flows through the orifice is not affected by pulsation as long as the gage indicates the average pressure ahead of the orifice and there is but very slight doubt that these gages do indicate the average pressure. In order to make sure of this point, two gages were installed on a Y connection, one of the gages being equipped with a shock absorber and the other direct to the line. In both cases the gages which had been previously calibrated with one another checked with one another in all tests.

A set of tests were conducted at various pressures without using the tanks or additional resistance with the results that the quantity as computed from each high pressure meter decreased until the outlet pressure was 200 pounds and then increased. However, as the pressure increased from 200 pounds to 400 pounds, the amount as computed from the critical flow orifice decreased, and the amount that was computed from the two high pressure meters increased. Additional tests were conducted with the tanks in line and the calculated rates of flow as measured by the high pressure meters were consistent with the rates of the critical flow orifice. However, the outlet meters and the critical flow orifice always showed a lesser rate than the inlet meter. It was subsequently found that this was due to leakage in the outlet line, the leakage increasing as the pressure increased and time increased.

In this particular instance the compressor was operated at approximately 200 revolutions per minute. When the inlet tank was in service, the effect of pulsation was reduced so that it was negligible (reading being reduced about three per cent.) and when the air was passed through the high pressure outlet tank, the effect of pulsation was removed at the two outlet meters. It was also noted that the effect of the pulsation was eliminated by creating a drop equivalent to two per cent. of the line pressure ahead of the outlet meters. The most noticeable effect produced by compressors and sometimes by regulators which causes gas to flow with rapid change in rate, is the vibration of the static pen arm. When this occurs it is likely that the differential reading is greater than the correct value.

The results of this test indicated that the error may be decreased or eliminated by increasing the volume or resistance between the source of pulsation and the meter, and in this particular case, the effect was eliminated when HV^2 was greater than

$$\frac{60{,}000\ P\ D^2}{R^2\ d^2}$$ in which

H = resistance in pounds between the source and the meter
V = volume in cubic feet between the source and the meter
P = line pressure in pounds per square inch absolute
R = revolutions per minute
d = diameter of orifice in inches
D = diameter of the pipe in inches.

It is quite probable that the numerical value of the constant which in this instance happened to be 60,000 should be some other amount, probably less or probably greater than 60,000.

Effect of Altitude

In connection with the purchase and sale price of gas, the question of how much is bought for a certain sum and the calculation of the total quantity seems to be a subject which should receive more consideration than it has received in a great number of contracts which have been written from time to time. This is especially true in connection with the purchase or sale of gas at locations where the altitude is considerably above sea level. The atmospheric pressure in a great many natural gas localities is from one to three pounds less than the average atmospheric pressure at sea level. In other words, it is not uncommon to have gas measured in locations where the atmospheric pressure is only 12 pounds per square inch absolute.

In the natural gas industry a great number of diffirent so-called standards have been used to express the term "cubic foot." Sometimes it is four ounces, sometimes eight ounces, one pound, two pounds, and three pounds gage pressure above the atmospheric pressure. This expression was more or less definite in the days when most of the gas was bought and sold in locations where the atmospheric pressure was about 14.4 pounds per square inch absolute or this was assumed to be the average atmospheric pressure. A large number of contracts have been written including the following expressions: "Atmospheric pressure 14.4" and "assumed atmospheric pressure 14.4", etc., stating the gage pressure above the atmospheric pressure as the basis for the computation of volume, regardless of actual value.

In the manufactured gas industry, it is fortunate that the American Gas Association or affiliated bodies have designated the quantity of gas which shall constitute a cubic foot by a well-defined expression, and that is, a cubic foot is the quantity of gas which is contained in a volume of one cubic foot when the pressure is 30 inches or mercury (mercury column measured at a temperature of 32 degrees F.) and the gas is at a temperature of 60 degrees F. and saturated with water vapor. This unit is definite as its value is independent of the atmospheric pressure.

Pressures are usually measured by gage above atmospheric pressure. The basis upon which the cubic foot is defined depends on the absolute pressure and the total quantity depends upon the absolute pressure in the line. Since the absolute pressure is the sum of the atmospheric pressure and gage pressure, the atmospheric pressure usually enters into all natural gas measurement problems in two ways. The first being a definition of the amount of gas which shall constitute a cubic foot and second the absolute pressure, the gage pressure of the gas being measured plus the atmospheric pressure.

Taking up the two phases of this particular problem, that is (1) the absolute pressure of the gas in the unit of a cubic foot, and (2) the absolute pressure of the gas being measured. These ideas should always be separated and not confused with one another. The absolute pressure to be used as a basis for a cubic foot may be expressed in absolute units rather than a gage pressure. If it is the desire of the parties making the contract that the quantity should be in cubic feet at four ounces above 14.4 pounds, the use of the expression "14.65 pounds per square inch absolute" is definite and does not depend upon the value of the atmospheric pressure. Likewise, a base pressure of eight ounces above 14.7 pounds may be expressed as "15.2 pounds per square inch absolute." The use of the absolute value is definite and leaves no doubt in the minds of the parties making the contract as to the value of the base pressure. The use of any expression of the actual or assumed value of the atmospheric pressure is eliminated.

In the case of measurement by positive displacement meters, the pressure multipliers are usually prepared for definite base pressures expressed as a certain number of ounces above 14.4 pounds, although all tables are calculated by using the absolute pressure corresponding to the value in ounces expressed in pounds added to 14.4 pounds. All of the later tables specifically mention the absolute value of the base pressure upon which the tables are calculated.

When measuring by orifice meter, similar conditions exist. The base pressure of the orifice coefficient may be expressed in pounds absolute and thereby remove any uncertainty as to the exact value which may be the case if it is expressed in ounces above the atmospheric pressure. The co-efficients have been expressed in ounces above 14.4 pounds per square inch absolute, but later tables state the values in absolute units so as to avoid any doubt.

Unless some mention is made regarding the zero value of the gage pressure or the absolute value of the atmospheric pressure, it is reasonable to assume that the average absolute value of the atmospheric pressure should be used for the computation of pressure multipliers for positive meters and pressure extensions for orifice meters.

The tables of pressure multipliers for positive meter measurement are calculated by assuming that the gage pressure of the gas to be measured is above a zero gage pressure value of 14.4 pounds. If, however, the gage pressure is measured in a locality where the atmospheric pressure is not 14.4 or is not assumed to be 14.4 pounds per square inch absolute, the tables can not be used for calculations as the absolute value of the gage pressure does not correspond to the ab-

(Continued on page 74)

[SECOND PART]

ROTARY FISHING *And* FISHING TOOLS

By HARRY PENNINGTON
Mechanical Engineer

EVENTUALLY, steels will be standardized by the American Petroleum Institute engineering division; when this is done, the steels, heat treatment and physical requirements for fishing tool work should receive careful treatment.

Further, as to fishing jobs. The Institute will eventually set up such standards of equipment and maintenance as will largely avoid fishing. Such standards cannot be forced into use, of course, but when they are set up in such way that their value is self-evident, the field will adopt them. Naturally, personnel is not a matter of standardization, for the human factor is beyond that; but standards that will eliminate the human factor, the personal equation, have in many industries relieved responsibility and at the same time, avoided troubles of a mechanical nature. The latter is the better part of standardization; the one or the group setting up standards, does so advisedly, with a basis of experience, coupled with technical assistance, which requires time. When such standards carry with them the assurance of reliability, the average field man accepts them, if he is not handicapped by something, such as equipment already on hand. A set of standards covering drilling practices for the prevention of accidents leading to fishing, and covering the basic design as to connections, steels and treatment, in fishing tool making should, without any doubt, prove its worth immediately. For instance, junked holes at Seminole ranged in cost somewhere between two and three millions of dollars, without including fishing in holes that were completed.

Drilling contractors paid the bill out of pocket, but the same bill was absorbed by producers in the additional price for drilling made necessary by these losses.

In drilling methods, every driller has his own standards, based on experience in drilling. If he turns the lever over to the derrick man for a few minutes, he will caution against certain things in the hole at that time, or there and then sets up a standard. If more hole can be made by spudding, or not by spudding, if thinning up is unsafe, if a bit makes more hole fast or slow, if the pipe whips too much above a certain speed—in fact, all the ifs might be thought of, but usually they are not. Standards prevent forgetting.

The steels most suitable for making fishing tools are the alloys, but which must be treated to develop strength and reliability, otherwise, without heat treatment, the body of a fishing tool is best

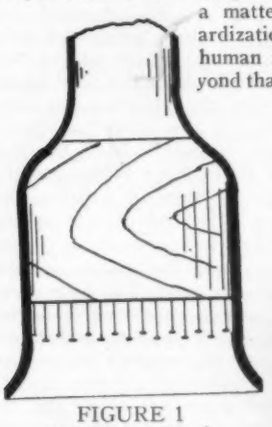


FIGURE 1
Impression Block

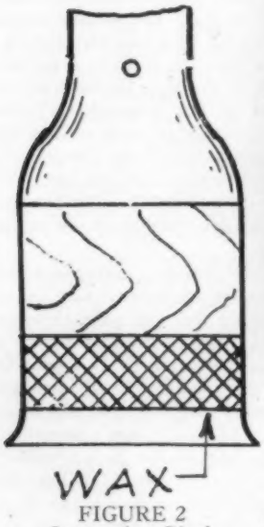


FIGURE 2
Impression Block

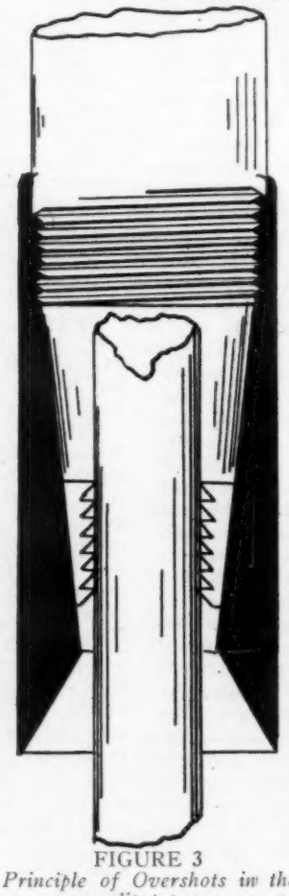


FIGURE 3
Principle of Overshots in the slip type

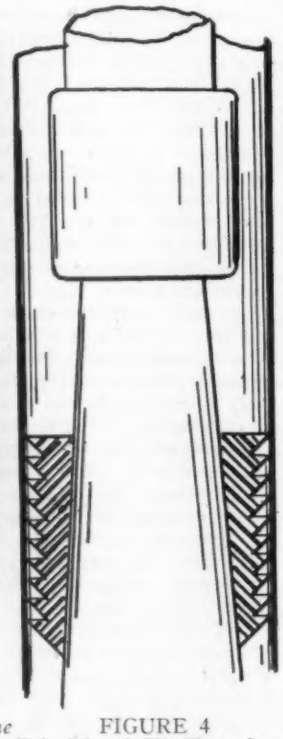


FIGURE 4
Principle of Slip-Type Spear

FIGURE 5
Releasing Slip Overshot (Edwards)

FIGURE 6
Releasing Slip Overshot (Edwards)

made of a mild, or low carbon forging grade of steel, annealed after forging.

The strength of an alloy steel, say S. A. E. 3250, treated for strength, may range up to over 150,000 pounds per square inch in tensile strength, depending upon the size of the piece somewhat, while the strength of mild forging steel may be less than half as great.

The size of fishing tools—the cross sectional areas—may be small, smaller than desired, but the strength may be brought up by using a better steel, heat treated, and the success of many tools depends on the latter, for treatment not only brings out the strength of a good steel, but removes the forging strains that make for unreliability.

When the body of a tool is hollow, a seamless tube may be used, and it, also, in medium carbon, from 0.30 to 0.50 may also be treated with advantage. If the body is made from a solid piece, and

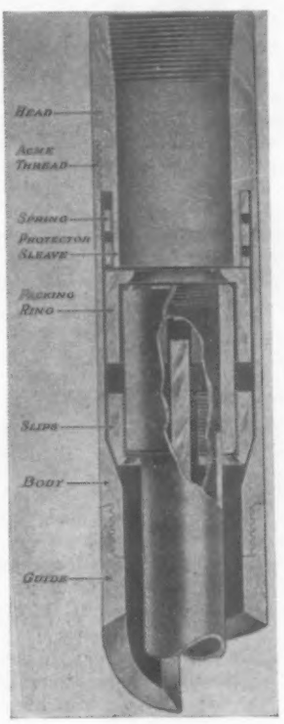


FIGURE 7
Packing Type Overshot (Lebus)

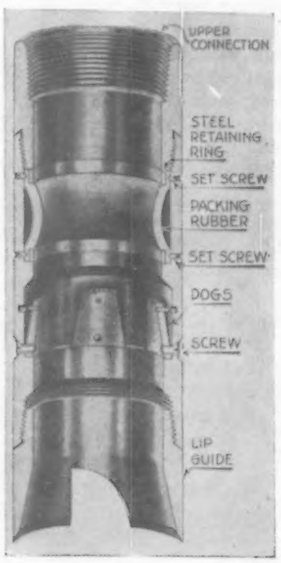


FIGURE 8
Releasing Overshot with Packing for Circulating (Gray)

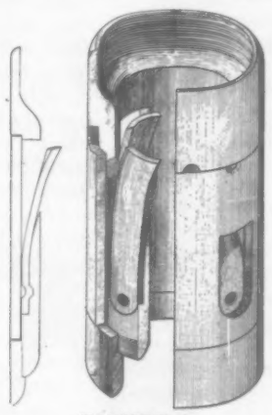


FIGURE 9
Dog Type Overshot. May be fitted with packing for circulating. (Regan)

FIGURE 10
Packing Type Overshot (Baash-Ross)

FIGURE 14
Dog Leg or Hydraulic Offset Tool (Baker)

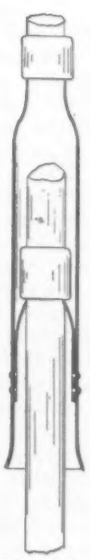


FIGURE 11
Dog Type Overshot

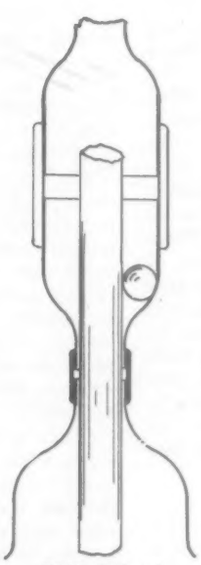


FIGURE 12
Overshot

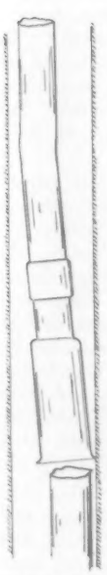


FIGURE 13

FIGURE 15
Spear, adapted for standard tools (Hinderliter)

drilled through or bored, it is best treated after being bored, securing a more thorough penetration of heat treating effect.

The hard spots of forging, and of making seamless tube, are removed by treatment, so that very smooth threads can be cut.

Slips require a hard surface to dig into and catch hold, but the interior should be soft, and tough to prevent breakage. Hence these are best made of a low carbon steel, case hardened, and then slightly drawn to remove brittleness.

Spring dogs may be made of 0.50 carbon alloy steel, treated for a low spring temper, to spring them without bending and taking a permanent set. The temper of a truck spring illustrates this requirement.

Coil springs and leaf springs may be wound from steel already treated, but are not so reliable as springs treated after winding. The untreated spring closes when compressed and will not spring back to its original length, while the treated spring, equally as well designed, will take its original length after many compressions.

Pins, usually called upon for hard duty, require maximum strength, which is secured only by using the test steel, treated.

Milling tools, called upon for cutting steel, require hard teeth, tough enough to prevent breaking off. These are made best with a soft, tough core, by using a low carbon steel and case hardening the same after machining.

The tap is made like a milling tool, of the same material, so that it will bend, but not break, but will cut threads in steel, even though the steel may be hard.

The threads by which fishing tools are attached to the pipe used for fishing are usually subjected to a pull, and to withstand heavy work, they should be coarse and of considerable length, accurately fitted. The heat treatment above referred to sets up the best machining qualities in steel, removing hard spots, brittle spots, so that smooth threads can be cut with greater accuracy than where the tool chatters in the lathe or milling machine.

In many fishing jobs, the fishing tool itself fails because of some defect in the forging operation—that is, the steel may be left in a strained condition after forging, and then snap off in the hole. One producer has a strict rule that no fishing tool of any kind may be placed in the hole unless the same has been heat treated to the certain knowledge of the driller and the field superintendent. This insures the best obtainable tools and the maximum reliability, because the strength may be easily doubled by treatment, coupled with the correct selection of steel for the purpose. Too much stress cannot be laid on this phase of fishing tool manufacture.

As a matter of fact, many fishing jobs, in fact, most of the fishing jobs due to broken fish tail bit shanks and blades, twisted off hydraulic nipples, twisted off drill collars, split drill collars, and all jobs caused by failure of steel may be eliminated by using only the best of steel —higher carbon alloy steel—coupled with the most accurate heat treatment for developing strength against shock, tension, torsion and bending.

We do not expect drillers, drilling foremen, and field superintendents to be experts in the selection of steels for equipment, nor to be proficient in its heat treatment; their business is something else. It is an impossibility to tell anything about a piece of steel fabricated into equipment without test; to purchase equipment, particularly equipment that goes below ground, without knowing its quality, or without knowing that the manufacturer places quality above everything else, invites trouble, for there is no substitute for quality in drilling equipment, tools and appliances.

If a twist off is near the top of the hole, the pump speeds up, indicating the same, but when near bottom, the difference in pump speed cannot be so easily detected.

A good indication of twist off is pump pressure; when circulation is passing through the water courses of any kind of bit, more pressure is required than when the bottom end of the pipe is open, and a quick reduction in pump pressure usually indicates some kind of trouble below.

Should pipe twist, and coil up, so as to restrict the opening through the pipe, rise in pump pressure may indicate the same before twisting off; in several cases, drill pipe has twisted so much as to shut the pump off entirely before parting.

Therefore, a pressure gauge is a necessity for indicating the operating pump pressure.

The chance of pulling pipe, stuck for any cause, decreases quickly the first hour or so for the longer pipe sets in the hole without circulation or rotation, the harder it usually freezes on account of sand and cuttings settling down in the hole. Fishing, therefore, is more successfully and quickly done if a tool of the proper kind is run immediately.

Some kind of fishing tool should be run as quickly as it can be gotten into the hole, and there should be no delay for stringing up more lines, or making tandem pump connections, but a pull should be taken immediately and then, if the fish will not come, time may be taken for stringing up more lines and strengthening the derrick, or making tandem connections.

This precaution requires that fishing tools be kept on the derrick floor, in good working order, ready to be run. These may not be elaborate, but may consist of overshot, spear and tap to suit the pipe and tool joints being run, and if the hole has been caving, a wall hook also may be necessary. This makes four fishing tools only; the complete list of tools is very large, and it would be impracticable to maintain a complete list, but the four mentioned tools will catch practically any section that may be up in the hole.

Other fishing jobs, such as pieces dropped in, may be fished for more leisurely, if driller's ever have anything like leisure; that is, the tool need not necessarily be on the derrick floor, but may be sent for, the time not being so important as when pipe is left in the hole.

In pulling, jerks on the pipe are not as effective as a sustained pull; to make the pull all the way down to a point where the pipe is frozen, a heavy strain for some length of time may be necessary—an hour or even a whole day may loosen frozen pipe when a pull of short duration will not. The writer has seen frozen pipe jump loose, upward, with the crew at meal with a strain left on the pipe.

Some holes are difficult to fish in because of cavey walls in soft formations, while other holes are made unsafe while drilling progresses. Thin slush will erode the well wall and set up caving, and since an enlarged section of the hole allows pipe to whip more at this point than where the hole is no more than full gauge, there should be no caving when it can be prevented.

To thin up at intervals means that the variable weight of slush alternately plasters the well wall with thick mud, then when mud is thinned, circulation washes the mud off and out, exposing the wall to the erosive effect of water thinned slush, which may set up caving.

When measuring slush for weight, that being pumped in is the correct measure—not that being pumped out—for hole making purposes because thick mud deposits out the solid portion found on the well wall, and the issuing mud is leaner, while thin mud takes up solids from the well wall, and the issuing mud is thicker by the amount taken off of the wall.

A continual thinning of mud as drilling goes on, checked by measurements taken at close intervals, say four times per shift, or oftener, will soon indicate just how thin mud can be carried safely, for caving can be detected immediately, and the slush can be thickened from the reserve pits to stop it.

As a measure of the carrying capacity of slush, measurements of weight of entering slush and comparison of the same with issuing slush is an excellent means, and when the solids brought out are in excess of the cubic footage dislodged by the bit, the source may be sought.

In fishing, circulation may assist in several ways and when circulation cannot be established, pressure may assist, and all tools for fishing therefore should have some means for establishing pressure inside of a lower section of twisted off pipe, down to the bit.

The taper tap, with a hole through the center, connects the upper section, used for fishing, with a joint, to the lower section being fished out, that may be made tight by leaving the upper section of tap unfluted and screwing the tap in sufficiently far, counting the turns of thread, to make a closure that will hold pump pressure, especially when there is accurate knowledge of just what is up in the hole.

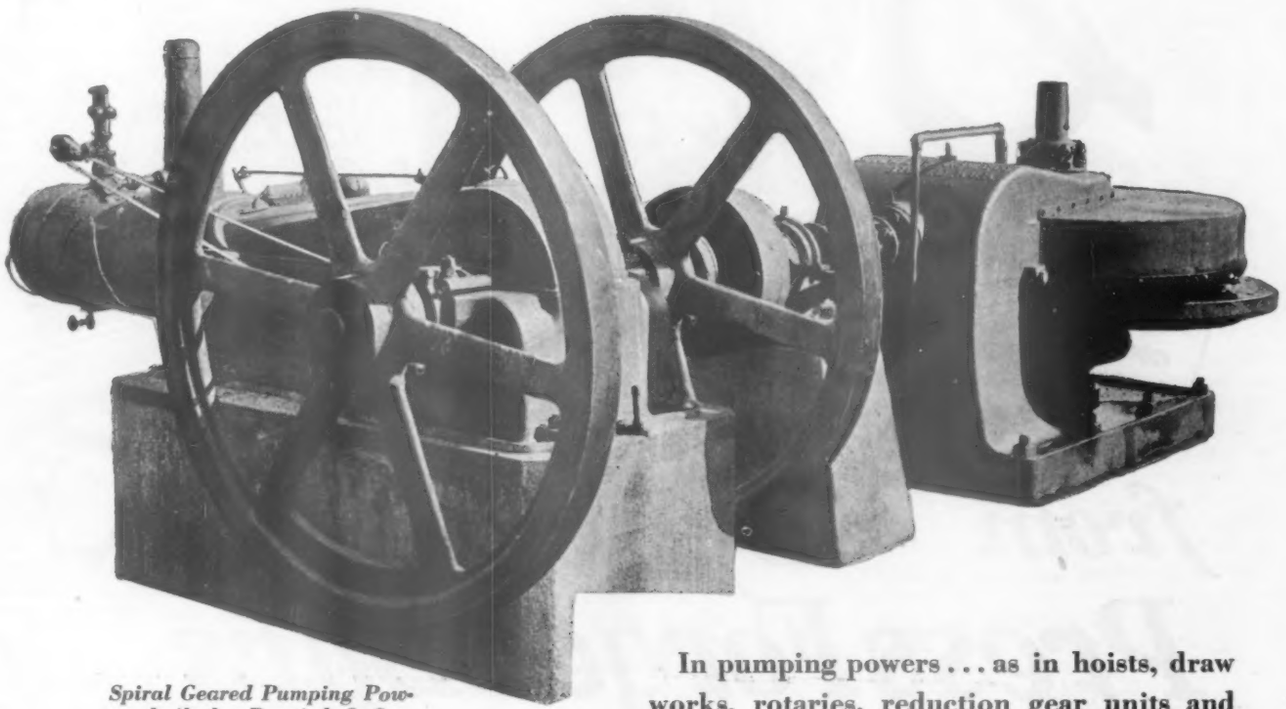
Other tools, such as spears and overshots, while passing circulation from the upper section of pipe to the lower, through water courses, will leak somewhat, but when the tool fills the space largely, or has means of packing between the tool and the pipe it is gripping, even

(Continued on page 76)

Hyattized Pumping Power

THE ability of Hyatt Roller Bearings to deliver smooth, uninterrupted performance under the stress of heavy loads and steady demands has placed Hyatt in an enviable position of preference among oil well equipment manufacturers.

With free-running Hyatts, friction, wear and lubrication are minimized . . . shutdowns for bearing repair eliminated, and speedier production made possible.



Spiral Geared Pumping Power, built by Bovaird & Seyfang Manufacturing Company, Bradford, Pennsylvania. Completely Hyatt equipped.

This pumping power is directly connected to an AY cut off clutch furnished by Bovaird & Seyfang, which is also Hyatt protected. The Jack Shaft which directly connects the gas engine and pumping power operates with a ball and socket Hyattized pillow block.

In pumping powers . . . as in hoists, draw works, rotaries, reduction gear units and other important equipment . . . Hyatts provide lasting bearing satisfaction, and permanent operating economy.

Bovaird & Seyfang Manufacturing Company, like most other leading builders of oil well machinery, find Hyatts a profitable investment. Why not play safe and specify Hyatt Roller Bearings for all your equipment?

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Say you saw it in The OIL WEEKLY

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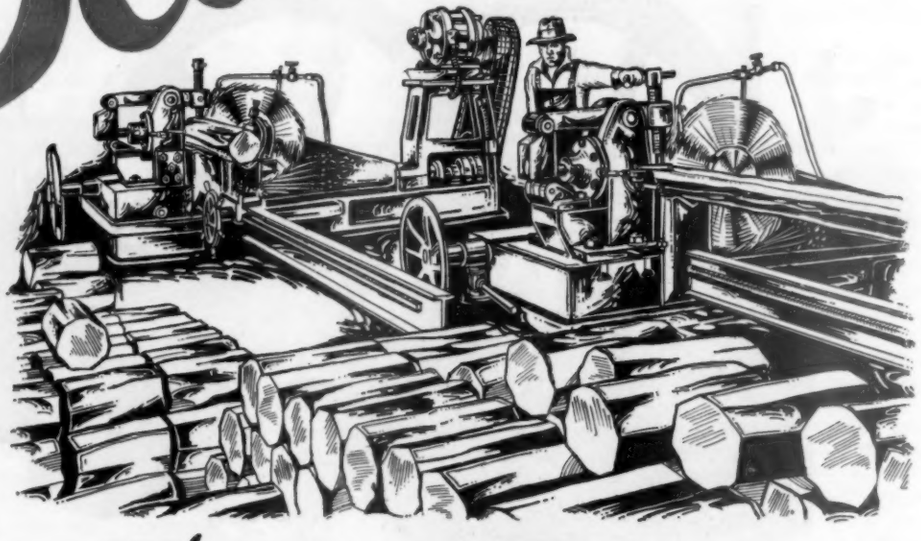

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Say you saw it in The OIL WEEKLY

Measuring Large Volumes *Of* Gas

By THOS. R. WEYMOUTH

President, Oklahoma Natural Gas Corporation, Tulsa, Oklahoma

THE orifice meter as it is used today in the measurement of gases is one of the youngest of the large family of meters designed for this purpose, and yet upon its records depends the transfer of millions of dollars each year. In 1925 the importance of checking the accuracy of the orifice meter was recognized by the Natural Gas Association of America and for this purpose it appointed the Gas Measurement Committee, a subcommittee of the Technical and Research Committee of the association. The study began in 1925 at Cleveland, with a determination of plate coefficients, that is, the factor to be used in conjunction with the observed pressure, temperature and gravity readings to convert them into a statement of the flow of gas through the meter. The coefficients of a few master plates, when mounted in a certain flange and operated under certain specified conditions, were established by comparison with a gas holder, which is recognized as the most reliable absolute standard of measurement available if operated with proper precautions.

During 1926 these master plates were used in Buffalo, New York, as the basis of the work done that year, principally on the determination of precautions that are necessary in the design of the orifice meter setting to avoid disturbances and false measurements due to the proximity of fittings, gates, regulators, etc. Not only did the work of 1926 result in the publication of a preliminary report giving recommendations for the proper installation of orifice meters, but it also contributed a vast quantity of information on the actual value of coefficients under certain conditions.

The work was continued at Buffalo during 1927, and, in addition to completing the study of orifice meter settings, it related principally to the investigation of the values of coefficients as affected by rate of flow of gas through the meter with static pressures practically constant.

Effect of Pressure

In 1928 the study turned to the effect of pressure upon the meter registration, and necessarily involved an investigation of the influence of super-compressibility of the gas, more commonly known as the deviation from Boyle's Law. After a few weeks at Buffalo, the scene of action was transferred to Hastings, West Virginia, where pressures were available higher than those in Buffalo.

All of the work done so far has related solely to the primary element of the meter, consisting of the orifice plate, flange and pressure taps, without reference to the secondary devices to be used for securing pressure records, as these devices are not involved in the work outlined by the committee.

It is difficult to conceive of a measuring device simpler than a round hole in a thin sheet of metal, and the information which this committee is accumulating points to the fact that it may be made one of the most accurate under a given set of conditions. Notwithstanding this fact, however, the committee has discovered as its work has progressed that in spite of the simplicity of the device itself, there are many complex factors affecting the flow of gas through an orifice and that the effect and the importance of each of them must be investigated before a final conclusion can be reached. They are as follows:

1—The Design of the Orifice Flanges

The effect of this factor is most noticeable in meters where the diameter of the orifice is large with respect to the diameter of the pipe. Very little work has been done as yet to determine this effect.

2—The Location of the Pressure Taps

There is an infinite number of combinations of pressure tap locations which could be made in the design of an orifice meter, and the effect of this factor is most important. In order to condense the work of the committee as much as possible its studies have been confined to the pressure tap locations appearing in the three types of meter most commonly used commercially, namely: (a) Flange taps 1 inch from the face of the flange, with coefficients figured on the downstream static pressure; (b) pipe taps, 2½ pipe diameters upstream and eight diameters downstream, with coefficients figured on the upstream static pressure, and (c) throat taps 2½ pipe diameters upstream and one-half diameter downstream, with coefficients figured on the upstream static pressure. The tests covering these three types of connection are being made simultaneously and therefore will give results which are strictly comparable.

3—The Diameter of the Pipe Line in Which the Meter is Installed

The work of the committee to date has been confined to studies upon 4-inch and 6-inch lines, but before definite conclusion can be formed it will be necessary to make tests upon additional sizes, and it is the intention of the committee to make such studies this summer on 12-inch and 16-inch meters.

4—The Eccentricity of the Orifice With Respect to the Axis of the Pipe

This factor is of particular importance with large ratios of d/D and has not been studied as yet by the committee.

5—Location and Nature of Fittings Near the Orifice Plate

The work of the committee during 1926 and the early part of 1927 covered this factor and its conclusions were embodied in the code leaflet issued by the committee on orifice meter settings, already referred to. While the committee may decide to do additional work on this subject later on, it was felt that the importance of the discoveries made as to the effect of disturbing influences warranted immediate recommendations to the industry. These recommendations, already published, were slightly modified at the last meeting of the committee and a revised issue has recently been printed.

6—The Design and Location of Straightening Vanes

During the work covering the factor just described it was discovered that the disturbing effect of nearby fittings could be eliminated under certain conditions by the use of straightening vanes, and the committee's conclusions on this subject are embodied in the code leaflet above described.

7—The Ratio of the Diameter of the Orifice to the Inside Diameter of the Pipe, Commonly Known as d/D

The commercial coefficient tables now in use show that as this ratio increases there is a corresponding increase in the coefficient. This factor is the one requiring the greatest amount of study, and while still incomplete, the committee's tests have provided considerable information showing that over much of the range covered, the results of these tests agree remarkably well with those on which the published tables were based. When one considers the wide variety of conditions under which the pioneer tests on the orifice were made and their relative crude-

ness as compared with the extreme care exercised in the work of the committee, this agreement is as surprising as it is gratifying.

8—The Rate of Flow, on Velocity of Gas Passing Through the Meter

Considerable data has been accumulated upon this factor and the committee has reached some fairly definite conclusions upon it. The work planned for the immediate future will add to this fund of information and is expected to confirm the conclusions reached up to the present.

9—The Static or Line Pressure

It has been known for some time that if two meters in series are measuring gas, one at a pressure of, say, 300 pounds and the other at a pressure of 10 pounds, the low pressure meter will register more gas than the high. In other words, the gas under high pressure is compressed into a smaller volume than would be indicated by Boyle's Law, which says that the volume of a given mass of gas is inversely proportional to the pressure. This effect is known as super-compressibility of the gas or the deviation from Boyle's Law, and its extent depends upon the character of the gas being measured. Any proper study of the orifice meter must determine the magnitude of this effect upon the registration of the meter as well as a method of compensating for it in order to obtain a correct measurement of the gas. The work of the committee on this point to date has covered pressures ranging from 40 to 300 pounds. Additional tests are now under way in California which will cover pressures up to 600 pounds, and the results so far obtained indicate that it will probably be possible to make a simple correction to the registration of a meter in accordance with the theory which is already known and which will be given in the final report of the committee.

10—The Condition of the Edge of the Orifice

The ideal orifice would have a perfectly sharp edge, that is, one in which a cross section through the plate would show the edge to be a perfect right angle without any rounding or bevel effect whatsoever. If the edge is not perfectly square the effect is to increase the coefficient of the orifice, and this effect becomes more and more pronounced the smaller the diameter of the orifice. While no direct measurements have been made on this factor, it has been found during the work of the committee that some of the orifices under test were not perfectly square-edged and that their coefficients were higher than those of a square-edged orifice by 1 per cent or more. Further work is desired on this point if it is found to be possible to fix a numerical index of the degree of dullness or rounding of the edge.

11—Condition of the Inner Surface of the Pipe Near the Orifice Plate

No direct tests have been made to determine the effect of roughness of the

(Continued on page 50)

Natural Gas Men Review Years Progress at Kansas City

By H. J. STRUTH

KANSAS CITY.—Natural gas men from every section of the country have gathered at Kansas City to attend the annual convention of the Natural Gas Department of the American Gas Association, which was officially opened here on May 6, extending through May 9.

More than 300 natural gas men were on hand on the opening day, and estimates reveal that more than 400 had arrived on the second day, which was the official opening of the business sessions.

With one of the finest exhibits of appliances and equipment ever shown at any convention of the natural gas industry, and an unusually fine program, it is evident that this meeting will go down on record as the most important and outstanding meeting in the history of the association.

The opening day, Monday, was devoted to special meetings of the main technical and research committees and the managing and advisory committee, as well as the official opening of the exhibit.

In view of the importance of natural gas as a unit in the American Gas Association, it was decided at the meeting of the management and advisory committee to take a vote on the advisability of holding future meetings of the Natural Gas Department apart from the regular annual meeting of the American Gas Association, which is customarily held at Atlantic City. This matter will be voted upon during the convention period. and it is anticipated that the result of the vote will prove conclusively that the natural gas industry is decidedly in favor of continuing the annual meetings of the Natural Gas Department.

Year's Progress

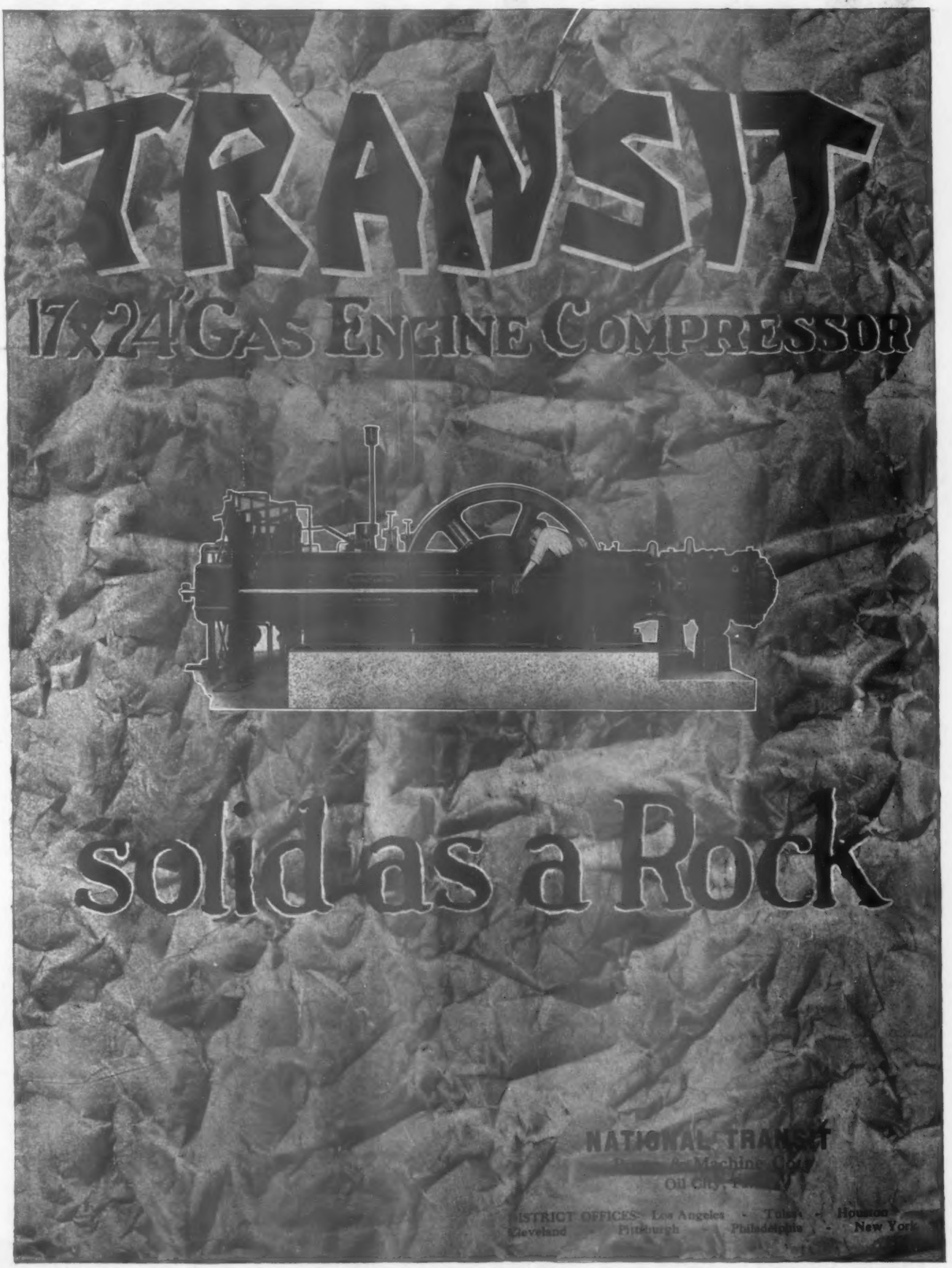
Importance of the natural gas industry was stressed by Chairman Meals in his annual address, in which he pointed out the remarkable progress that has been made during the past year. He also pointed out the fact that 1929 will prove to be one of most remarkable developments for the industry because of the vast projects that are contemplated during this year. He cited the fact that numerous large natural gas transmission projects are now being consummated that will greatly broaden the scope of the natural gas industry during 1929; among them being the laying of lines from the Monroe gas field in Louisiana to Memphis, Tennessee, completion of a gas line from Lea County, New Mexico to El Paso, Texas, and the beginning of work on a gas line from Wyoming to Salt Lake City and Ogden, Utah.

Mr. Meals also pointed out that the natural gas industry is entering a new era, even though the industry is 100 years old, stating that it can be truthfully said that the industry is really only in its infancy.

In line with Chairman Meals address comes the official announcement of another projected natural gas line from the Monroe gas field in Louisiana to Atlanta, Georgia. This line is said to be contemplated by Ford, Bacon & Davis, Inc., involving the construction of 1400 miles of pipe line, at an estimated cost of $35,000,000. The new line will be laid from Monroe gas field through Birmingham, Alabama, thence to Atlanta, Georgia, and will include a number of large cities en route. Contracts have already been made with numerous large industrial enterprises and it is now anticipated that the line will be completed by December 31. Companies interested in this project are Standard Oil Company of New Jersey, Electric Bond and Share Company, Southern Carbon Company, Moody-Seagraves Company and Palmer Corporation. Following Chairman Meal's address, E. J. Stephany, newly appointed secretary of the Natural Gas Department, presented his report to the delegates and pointed out that the individual membership in the association was steadily increasing, now standing at 1356 individual memberships as compared with 1278 last year.

H. C. Morris, vice-chairman of the department, presented his list of appointments of the committee on the chairman's address. John M. Garard, Columbus, Ohio, read his report "In Memoriam," giving a list of those who had died during the past year. Oscar Fogg, president of the American Gas Association, addressed the delegates, citing the remarkable work that had been done during past year by the Natural Gas Department and the spirit of cooperation that exists between the department and the American Gas Association. President Fogg concluded his address by announcing that Keith Clevenger, of the Empire Companies, Bartlesville, Oklahoma, had been selected to become director of public relations and advertising of the American Gas Association, beginning June 1. Mr. Clevenger is well known throughout the natural gas industry and the announcement of his appointment will be received with great pleasure by all who know him and with the realization that he will prove to be of great value to the industry in his new capacity.

A particularly constructive paper on the program of the first day's sessions was read by W. A. Jones, chairman of the executive committee of Henry Doherty Company, New York. Jones reviewed the history of the natural gas industry, citing the trials that attended its early development in this country and pointing out some constructive ideas on the future of the natural gas industry. He particularly stressed the apparent enormous waste of natural gas in connection with the production of petroluem and stated that the petroleum industry was at last giving serious thought to he conservation of both gas and oil.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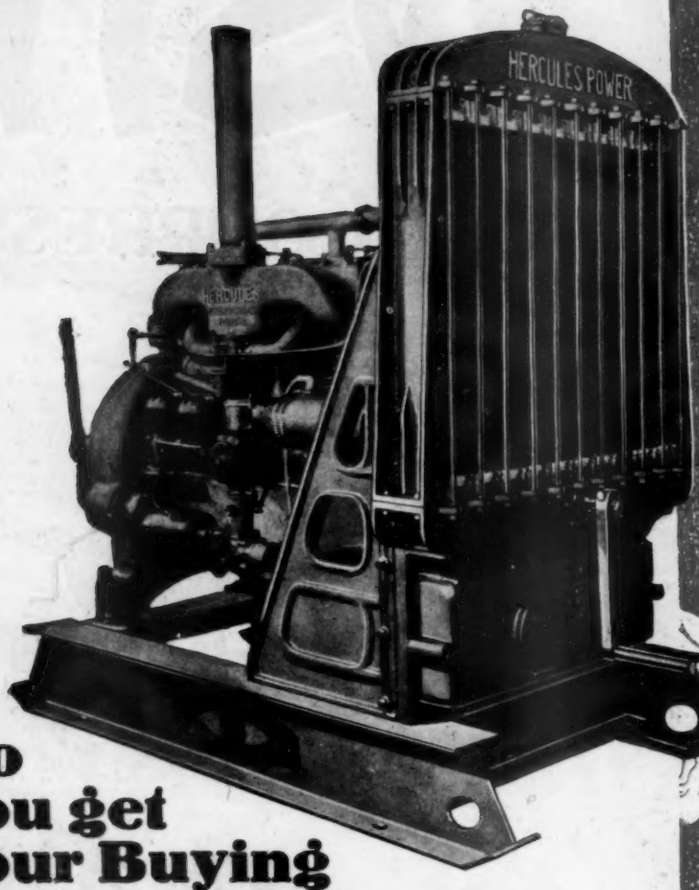

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CONTINENTAL

Markets--Production--Crude Prices

H. J. STRUTH, *Staff Economist, Houston, Texas*

Proration Effort Brings Further Slight Decline

DAILY average production of crude oil for the nation showed a continuation of the downward trend established the week ending April 27 when American Petroleum Institute estimates credited the daily average as being 2,629,850 barrels for the week ending May 4. This represents a drop of 20,800 barrels in the daily average yield.

Concrete results of proration measures in California, which showed a decline of 36,500 barrels in daily average production, were more than enough to offset gains registered in Oklahoma, the Gulf Coast, Kansas, Arkansas, the Eastern States and the Rocky Mountain States.

Oklahoma's production for the week ending May 4 showed an increase of 12,800 barrels in the daily average, due to the fact that that state was "gauging," preparatory to establishment of definite proration policy bases. The same condition probably was responsible for the unusual gain of 5400 barrels in the more or less settled fields of the Mountain States.

HOW LAST WEEK'S DAILY AVERAGE PRODUCTION COMPARES WITH AVERAGE OF 1928

	Daily Av'ge Year 1928 (Bureau of Mines Data)	Daily Av'ge May 4, 1929 (A. P. I. Wkly Prod. Rept.)	Excess
Oklahoma-Kansas	786,585	787,750	1,115
Texas-Louisiana-Arkansas	849,205	907,700	58,495
California	633,831	751,200	117,369
Balance of United States	190,391	183,200	7,191
Total United States	2,460,012	2,629,850	184,170
Mexico-Central and South America	561,339	609,249[1]	47,910
Grand total	3,021,351	3,239,099	232,080

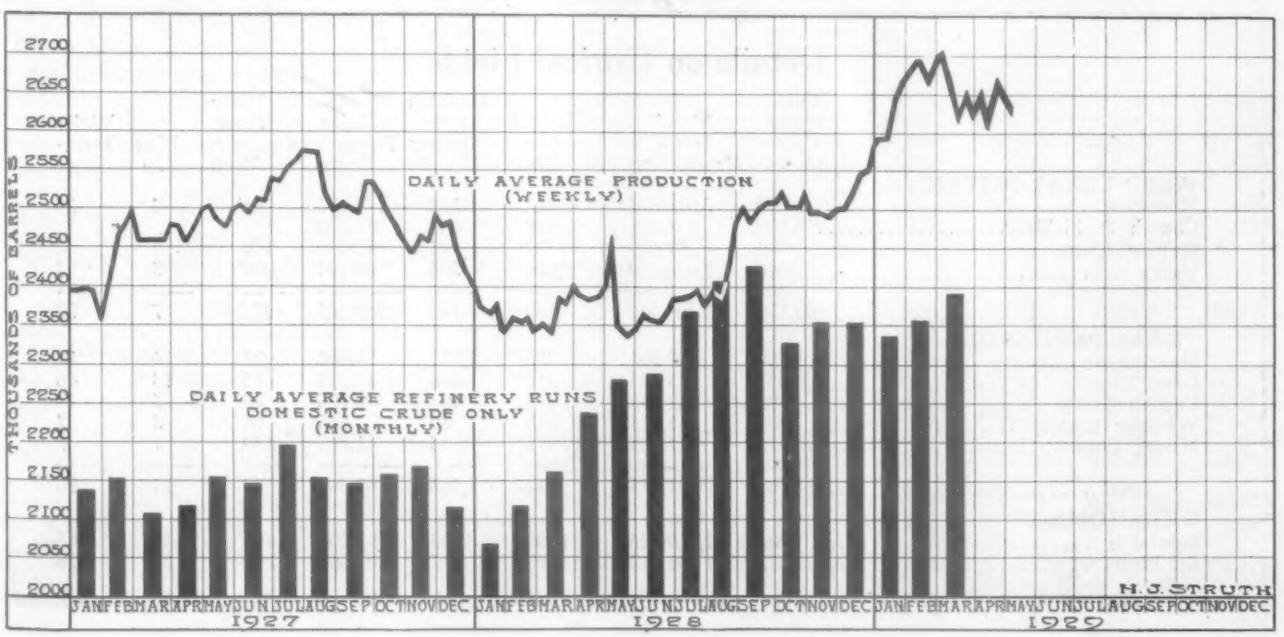
[1]As of March 30, 1929—latest date available.

Gains in Kansas, Arkansas and the Eastern States were negligible in the face of a 6500-barrel drop in Texas outside of the Gulf Coast.

It is becoming increasingly more difficult to keep back optimism among Oklahoma operators, and this despite the fear expressed by many that an increase in the market would be one of the worst things to happen in that it would encourage additional drilling and hinder all efforts at keeping production at a minimum.

At the present time approximately 30,000 barrels daily is being withdrawn from storage in Oklahoma and Kansas. A number of companies are still adding to storage, but others are very hard up for crude with which to supply their requirements. Between 75,000 and 80,000 barrels daily is

DOMESTIC PRODUCTION AND REFINERY RUNS



being shut in at Seminole, according to the latest potential gauge, which would make up for any withdrawals. The opening at Seminole would still leave some companies short on crude, while others would be over-burdened.

There is considerable talk at present to the effect that the proration lid at Seminole will be lifted on May 13, when the hearing comes up for trial before the State Corporation Commission. The commission extended the shutdown only 15 days a short time ago, or from May 1 to 15. The fact that it was not extended longer is thought indicative of the withdrawal of the curb. At the same time some of the companies short on crude are asking that it be lifted. It is doubtful if Seminole could long maintain its 75,000 surplus production if not prorated, since it has been showing declines in potential gauges.

If Seminole is opened up a different aspect would be put on the Mid-Continent light oil market, as it might prevent any increase in price forthcoming under the present plan of conservation. This, besides disrupting the entire national proration movement.

While the talk of lifting the proration at Seminole continues, Umpire Ray Collins is circulating a petition asking the State Corporaton Commission for a hearing on a state-wide program to succeed the Seminole proration. It is understood that the commission may favor this method over the local application of proration at Seminole, which may account of it not extending the Seminole shutdown longer. Under the state-wide plans all wells making over 100 barrels daily would be prorated. This would add the Oklahoma City, McCully, Allen, Asher, and a few wildcats to the list, in addition to Seminole.

Group 3 gasoline market continues to increase. Many of the larger companies have raised their top prices to 7¾ cents a gallon for U. S. motor, with other concerns holding from 7¼ to 7⅝ cents. Magnolia Petroleum Company jumped its tank wagon price to 19 cents last week, an increase of one cent, but announced that special discount of two cents a gallon would be coming to those who deserved it. This prompted the Pierce Petroleum Corporation to cut its prices two cents but no other company had followed. Kerosene continued weak with the average price around 6 to 6¼ cents.

Two Lines Give New Mexico Outlet for Oil Production

ARTESIA, New Mexico. — Completion of construction work within the past week on trunk line extensions from the Winkler County section of West Texas district into the southeastern part of Lea County, New Mexico, by Humble Pipe Line Company and The Texas Pipe Line Company affords the latter state its first major pipe line connections, and a ready market for oil from the completed wells and that expected from the numerous drilling tests now underway in Lea County. Since the quality of the oil available from completed wells within reasonable reach of the above two trunk line systems is somewhat similar in quality to that produced in Winkler County, a price of 65c per barrel has been posted, or the same as that being paid for the bulk of West Texas crudes.

Humble Pipe Line Company began running oil early this week from the Skelly Oil Company's wildcat producer on the Joyner permit in Section 26-25S-36E through its eight-inch carrier, which was extended from the Leck-Daugherty pool, Winkler County, about 10 miles, and is making arrangements to build gathering lines to other producers that have not been served with a market outlet heretofore. Humble Pipe Line Company is using a temporary field pumping unit in lieu of a main line station to handle its Lea County crude purchases until the volume justifies a larger installation.

Trunk Line Unit Completed

The Texas Pipe Line Company has completed its 10-inch trunk line extension from Hendrick field, Winkler County, to a point near the town of Jal, Lea County, with a station located in the NE¼ Section 5-26S-37E, but will not pump oil southward until its West Texas trunk line system to Houston is put in operation early in June. However, The Texas Pipe Line Company has erected two 55,000-barrel steel tanks on the above station site and is connecting up with nearby wells to store oil in the meantime. A connection was made with the Cranfill & Reynolds, Inc., and Devonian Oil Company's producer on the Wilson permit, Section 23-25S-36E, about April 27, and the company is running this oil to storage.

Maljamar pool, located on the west edge of Lea County, is being served by a small line that extends to the Artesia field gathering system of Illinois Pipe Line Company. The oil is

Details on Critical Fields

Pool—	Oil Wells Completed	Total Initial Production	Initial Per Well	Number Producing Wells	Daily Production Barrels	Daily Prod. Per Well	Rigs Up	Wells Drilling
WEST TEXAS DISTRICT:								
Hendrick	570	3,016,655	5,302	580	143,645	248[1]	3	25
Church & Fields	189	203,465	1,077	187	25,200	135	.	.
Gulf-McElroy	73	57,075	782	71	12,470	176	1	2
Yates	310	2,026,250	6,536	304	88,190	290[1]	3	3
Total	1,142	5,303,445	4,644	1,142	269,505	236	7	30
TEXAS PANHANDLE:								
Hutchinson County	1,158	550,895	476	1,011	25,690	25	4	17
Gray County	351	145,805	415	338	25,335	75	13	46
Carson County	192	62,635	326	162	6,775	42	3	19
Wheeler County	45	14,775	328	36	655	18	3	7
Moore County	15	7,065	471	13	1,805	139	1	7
Total	1,761	781,175	444	1,560	60,260	39	24	96
OKLAHOMA—								
Seminole	1922	2,319,523	1206	1533	292,200[1]	190	25	167
St. Louis	422	408,943	969	347	102,668[1]	296	27	76

[1]Prorated.

being consumed by local refineries. This oil tests about 36° gravity and brings a better price than that posted for oil in the southeastern part of Lea County.

Three new locations announced for Lea County within the past week are as follows:

The Texas Company's Anna C. Moore (Government permit) 1.-330 feet from northwest corner of SE¼ Section 24-20S-32E.

Cranfill & Reynolds, Inc., et al's State 1-B, 330 feet from northeast corner of Section 3-21S-33E.

H. W. Andrews et al's Andrews permit 1-330 feet from southwest corner of Section 12-20S-36E.

Moving West Texas Oil to Wynnewood

Fort Worth, Texas.—Movement of West Texas crude in tank cars is to be started late this week by the Texas Pacific Coal & Oil Company to its refinery at Wynnewood, Oklahoma. The company has about 1600 barrels of settled production in the McCamey field, and about 105,000 barrels of oil stored in an 80,000- and a 55,000-barrel steel tank. A six-car rack is being erected on the south side of the Orient Railroad, east of McCamey, and in the south part of the John Nidever survey No. 2. A freight rate of 18½ cents per 100 pounds is reported to have been obtained on the McCamey-Wynnewood crude movement. The latter plant is rated at 2500 barrels daily, and has been operating regularly on South Oklahoma crudes. C. H. Martin is superintendent in charge of pipe lines and crude shipments in tank cars. Humble Pipe Line Company is now connected to the McCamey field leases of the Texas Pacific Coal & Oil Company.

California Division Has Crooked Hole Program

Los Angeles.—At a meeting April 30 of the development and production section of the A. P. I., California division, A. L. Weil, chief counsel for General Petroleum Corporation, gave an address of explanation of gas conservation law as applied to field operations. He showed that the law will have more permissive than coercive provisions and will be applicable only when there is an unreasonable waste. Weil also stated aside from his primary subject that he thought if bankers would cut off unnecessary credit to the oil industry there would not be so much foolish development.

Martin Van Couvering, petroleum engineer, read a paper on "A Survey of Factors Believed to Affect the Courses Followed By Drill Holes." R. D. Elliott, manager of Oil Field Service Company, read a paper on "Practices For Drilling Straight Holes and Remedying Crooked Holes."

All officers were re-elected for the coming year.

Improvements Shown, Bureau Of Mines Reports

WASHINGTON.—According to reports received by the Bureau of Mines, Department of Commerce, the production of crude petroleum in the United States during March, 1929, amounted to 82,515,000 barrels. Although this was the largest amount ever produced in any month, the daily average which it represented, 2,662,000 barrels, was considerably below the record figure for February, 2,703,000 barrels. Of the three leading producing states, California, Texas and Oklahoma, Texas was the only one to record an increase in daily average production in March. This resulted in the main from increased output of the Salt Flat field. California showed a decrease, which was largely due to the decline at Santa Fe Springs. Oklahoma showed a material decline, this being due to a more or less general curtailment throughout the state.

Stocks of crude east of California continued to increase but at a much reduced rate, as compared with February. The increase in stocks east of California was approximately 2,700,000 barrels, of which over half was in refinery stocks. Stocks of light oil and heavy crudes in California increased nearly 3,500,000 barrels, the major portion of which occurred in light oils. The reduction in daily average crude production with a consequent lessening in the amounts of crude going to storage was reflected in the change in stocks of all oils, which in March increased at a slower rate than in February. Another factor which operated to reduce the amount of oil going to storage was the increase in gasoline consumption, although this was practically nullified by the opposing factor of decreased fuel oil consumption.

Following is the Bureau of Mines analysis of supply and demand of all oils for March:

ANALYSIS OF SUPPLY AND DEMAND OF ALL OILS
(Including wax, coke, and asphalt in thousands of barrels of 42 U. S. gallons)

	March 1929	February 1929[1]	March 1928	Jan-Mar. 1929	Jan-Mar. 1928
NEW SUPPLY:					
Domestic production:					
Crude petroleum:					
Light	73,713	67,743	65,940	216,268	191,086
Heavy	8,802	7,950	8,569	23,919	24,607
Total crude	82,515	75,693	74,509	240,187	215,693
Natural gasoline	4,324	3,736	3,471	12,043	10,200
Benzol	264	233	238	747	681
Total production	87,103	79,662	78,218	252,977	226,574
Daily average	2,810	2,845	2,523	2,811	2,490
Imports:					
Crude	6,790	7,016	6,845	21,881	19,026
Refined	1,489	908	1,135	3,281	3,354
Total new supply all oils	95,382	87,586	86,198	278,139	248,954
Daily average	3,077	3,128	2,781	3,090	2,736
Change in stocks all oils	8,467	8,864	5,954	29,047	23,321
DEMAND:					
Total demand	86,915	78,722	80,244	249,092	225,633
Daily average	2,804	2,812	2,589	2,768	2,479
Exports: [2]					
Crude	1,572	1,678	1,530	5,222	4,005
Refined	10,801	9,506	11,247	32,021	32,559
Domestic demand	74,542	67,538	67,467	211,849	189,069
Daily average	2,405	2,412	2,176	2,354	2,078
Excess of daily average domestic production over domestic demand	405	433	347	457	412
STOCKS (end of month):					
Crude petroleum:					
East of California [3]					
Light	327,634	325,766	318,071	327,634	318,071
Heavy	52,025	51,173	51,178	52,025	51,178
California:					
Light	24,067	21,810	19,633	24,067	19,633
Heavy [4]	100,504	99,284	94,484	100,504	94,484
Total crude	504,230	498,033	483,366	504,230	483,366
Natural gasoline at plants	995	821	843	995	843
Refined products	137,305	135,209	128,719	137,305	128,719
GRAND TOTAL STOCKS ALL OILS	642,530	634,063	612,928	642,530	612,928
Days' supply [5]	229	226	237	232	247
Bunker oil (included above in domestic demand)	4,213	4,252	4,236	12,380	11,770

[1]Revised. [2]Includes shipments to Alaska, Hawaii, and Porto Rico. [3]Exclusive of producers' stocks. [4]Includes fuel oil. [5]Grand total stocks divided by daily average total demand.

CRUDE OIL PRICE QUOTATIONS

Revised May 7, 1929

CRUDE PRICE CHANGES

Effective May 1, The Texas Company posted a price of 65 cents on Lea County and West Texas crude oils.

EASTERN STATES

(Effective March 12, 1929)

Penna Grade Oil in New York Transit Lines (New York)	$4.10
Grandford District Oil in National Transit Lines (Pennsylvania)	4.10
Penna Grade Oil in National Transit Lines (Pennsylvania)	4.00
Penna Crude Oil in Southwest Pennsylvania Lines (West Virginia)	4.00
Penna Grade Oil in Eureka Pipe Line Lines (Pennsylvania)	3.90
Penna Grade Oil in Buckeye Pipe Line Lines (Ohio)	3.85
Cabell Grade Oil in Eureka Pipe Line Lines (West Virginia)	1.35
Corning 35-cent Grade Oil in Buckeye Pipe Line Co.'s lines	1.80
Corning 25-cent Grade Oil in Buckeye Pipe Line Co.'s lines	1.75
Somerset Oil in Cumberland Pipe Line lines (Kentucky)	1.50
Ragland Grade Oil in Cumberland Pipe Line lines (Kentucky) (Effective Jan. 29, 1929)	.60
Keister (Pennsylvania)	1.20

CENTRAL STATES

(Effective April 26, 1929)

Posted by Ohio Oil Co.

Illinois	1.60
Indiana	1.42
Lima	1.65
Plymouth	1.18
Princeton	1.60
Waterloo	1.25
Wooster	1.75

MID-CONTINENT

(Effective January 24, 1929)

Magnolia Petroleum Company

Under 26	.60
26 to 26.9 gravity	.65
27 to 27.9 gravity	.70
28 to 28.9 gravity	.75
29 to 29.9 gravity	.80
30 to 30.9 gravity	.90
31 to 31.9 gravity	1.00
32 to 32.9 gravity	1.08

From 33 to 44 gravity and above, Magnolia Petroleum Company prices are the same as those of Carter Oil Company.

MID-CONTINENT

(Effective January 25, 1929)

Carter Oil Company, Gulf Pipe Line Company, Sinclair Pipe Line Company, Prairie Oil and Gas Company and The Texas Company

25 to 25.9gravity	.66
26 to 26.9 gravity	.72
27 to 27.9 gravity	.78
28 to 28.9 gravity	.84
29 to 29.9 gravity	.90
30 to 30.9 gravity	.96
31 to 31.9 gravity	1.02
32 to 32.9 gravity	1.08
33 to 33.9 gravity	1.11
34 to 34.9 gravity	1.14
35 to 35.9 gravity	1.17
36 to 36.9 gravity	1.20
37 to 37.9 gravity	1.23
38 to 38.9 gravity	1.26
39 to 39.9 gravity	1.29
40 to 40.9 gravity	1.32
41 to 41.9 gravity	1.35
42 to 42.9 gravity	1.38
43 to 43.9 gravity	1.41
44 and above	1.44

WESTERN KENTUCKY

All grades	1.68

PANHANDLE

(Effective January 24, 1929)

GRAY COUNTY

(Humble Oil & Refining Company, Magnolia Petroleum Company, Gulf Pipe Line Company and Sinclair Pipe Line Company).

Below 29 gravity	.69
29 to 29.9 gravity	.75
30 to 30.9 gravity	.81
31 to 31.9 gravity	.87
32 to 32.9 gravity	.93
33 to 33.9 gravity	.96
34 to 34.9 gravity	.99
35 to 35.9 gravity	1.02
36 to 36.9 gravity	1.05
37 to 37.9 gravity	1.08
38 to 38.9 gravity	1.11
39 to 39.9 gravity	1.14
40 to 40.9 gravity	1.17
41 to 41.9 gravity	1.20
42 to 42.9 gravity	1.23
43 to 43.9 gravity	1.26
44 and above	1.29

WHEELER COUNTY

(Humble Oil and Refining Company and Magnolia Petroleum Company)

Below 30 gravity	.70
30 to 30.9 gravity	76
31 to 31.9 gravity	.82
32 to 32.9 gravity	.88
33 to 33.9 gravity	.91
34 to 34.9 gravity	.94
35 to 35.9 gravity	.97
36 to 36.9 gravity	1.00
37 to 37.9 gravity	1.03
38 to 38.9 gravity	1.06
39 to 39.9 gravity	1.09
40 to 40.9 gravity	1.12
41 to 41.9 gravity	1.15
42 to 42.9 gravity	1.18
43 to 43.9 gravity	1.21
44 and above	1.24

CARSON-HUTCHINSON COUNTIES

(Humble Oil and Refining Company, Magnolia Petroleum Company and Gulf Pipe Line Company)

Below 32 gravity	.72
32 to 32.9 gravity	78
33 to 33.9 gravity	.81
34 to 34.9 gravity	.84
35 to 35.9 gravity	.87
36 to 36.9 gravity	.90
37 to 37.9 gravity	.93
38 to 38.9 gravity	.96
39 to 39.9 gravity	.99
40 to 40.9 gravity	1.02
41 to 41.9 gravity	1.05
42 to 42.9 gravity	1.08
43 to 43.9 gravity	1.11
44 and above	1.14

WEST TEXAS

(Humble, Gulf, Magnolia, The Marland Company and Southern Crude Oil Purchasing Company)*

Crane-Upton, Crockett, Pecos and Winkler Counties, all grades	.65

*Gulf does not post in Winkler County; Magnolia posts in Crane, Upton and Winkler Counties. Southern Crude Oil Purchasing Company posts only in Crane, Upton and Winkler Counties.

Lea County and West Texas crudes..... .65

Posted by The Texas Company

CALIFORNIA CRUDE OIL PRICES AT THE WELL

(EFFECTIVE JANUARY 18, 1929)

Following are the current prices offered by Standard Oil Company for crude oil at the well: (Price per barrel of 42 gallons infields indicated)

Gravity	Ventura *	Signal Hill	Alamitos Heights-Seal Beach	Huntington Beach	Inglewood	Olinda-Brea Canon	Athens-Rosecrans Dominguez	Elwood † Terrace	Torrance	Richfield	Whittier La Habra	Montebello	Coyote Hills	Santa Fe Springs	Newhall McKittrick Kern River	Midway-Sunset Elks Hills	Buena Vista Hills	Lost Hills	Coalinga	Wheeler Ridge
14-14.9	$ .85	$ .70	$ .70	$ .70	$ .70	$ .70	$ ..	$ ..	$ .70	$ .70	$ .70	$ .70	$ .70	..	$ .50	$ .50	$ .50	$ .50	$ .50	$ .50
15-15.9	.85	.70	.70	.70	.70	.70	..	..	.70	.70	.70	.70	.70	..	.50	.50	.50	.50	.50	.50
16-16.9	.85	.70	.70	.70	.70	.70	..	..	.70	.70	.70	.70	.70	..	.50	.50	.50	.50	.50	.50
17-17.9	.85	.70	.70	.70	.70	.70	..	..	.70	.70	.70	.70	.70	..	.50	.50	.50	.50	.50	.50
18-18.9	.85	.75	.75	.75	.75	.75	..	..	.75	.75	.75	.70	.75	..	.50	.56	.56	.56	.56	.56
19-19.9	.85	.80	.80	.80	.80	.80	..	..	.80	.80	.80	.75	.80	..	.50	.62	.62	.62	.62	.62
20-20.9	.85	.85	.85	.85	.85	.85	..	..	.85	.85	.84	.80	.84	..	..	.68	.68	.68	.68	.68
21-21.9	.86	.89	.89	.89	.89	.89	..	..	.89	.89	.88	.85	.88	.89	..	.74	.74	.74	.74	.74
22-22.9	.87	.93	.93	.93	.93	.93	..	..	.93	.93	.91	.90	.91	.92	..	.80	.80	.80	.80	.80
23-23.9	.90	.97	.97	.97	.97	.97	..	..	.97	.97	..	.95	.94	.95	..	.85	.85	.85	.85	.85
24-24.9	.94	1.01	1.01	1.01	1.01	1.01	1.01	..	1.01	1.01	..	.98	.97	.98	..	.90	.90	.90	.88	.88
25-25.9	.98	1.05	1.05	1.05	1.05	1.05	1.05	..	1.05	1.05	..	1.01	1.00	1.01	..	.95	.95	.95	.91	.91
26-26.9	1.02	1.09	1.09	1.09	1.09	1.09	1.09	..	1.09	1.09	..	1.04	1.04	1.04	..	1.00	1.00	1.00	.94	.94
27-27.9	1.06	1.13	1.13	1.13	1.13	1.13	1.13	..	1.13	1.13	..	1.07	1.08	1.07	..	1.05	1.05	1.05	.98	.97
28-28.9	1.10	1.17	1.17	1.17	1.17	1.17	1.17	..	1.17	1.17	..	1.10	1.12	1.10	..	1.10	1.10	1.10	1.02	..
29-29.9	1.14	1.21	1.21	1.21	..	1.21	1.21	..	..	1.21	..	1.13	1.16	1.15	..	1.16	1.16	1.16	1.06	..
30-30.9	1.18	1.25	1.25	1.25	..	1.25	1.25	..	..	1.25	..	1.16	1.20	1.20	..	1.22	1.22	1.22	1.10	..
31-31.9	1.23	1.30	1.30	1.30	..	..	1.30	..	..	..	..	..	..	1.25	..	1.28	1.28	1.28	1.14	..
32-32.0	1.28	1.35	1.35	1.35	..	..	1.35	..	..	..	..	..	..	1.30	..	1.34	1.34	1.34	1.18	..
32-32.9	..	..	..	..	..	..	1.41	..	..	..	..	..	..	1.35	..	1.40	1.40	1.40	1.22	..
34-34.9	..	..	..	..	..	..	1.47	1.16	..	..	..	..	..	1.40	..	..	..	1.46	1.26	..
35-35.9	..	..	..	..	..	..	1.53	1.22	..	..	..	..	..	1.45	..	..	..	..	1.30	..
36-36.9	..	..	..	..	..	..	1.59	1.28	..	..	..	..	..	1.50	..	..	..	..	..	..
37-37.9	..	..	..	..	..	..	1.65	1.34	..	..	..	..	..	1.55	..	..	..	..	..	..
38-38.9	..	..	..	..	..	..	1.71	1.40	..	..	..	..	..	1.60	..	..	..	..	..	..
39-39.9	..	..	..	..	..	..	1.77	1.46	..	..	..	..	..	1.65	..	..	..	..	..	..
40-40.9	..	..	..	..	..	..	1.83	1.52	..	..	..	..	..	..	..	..	..	..	..	..
41-41.9	..	..	..	..	..	..	1.89	1.58	..	..	..	..	..	..	..	..	..	..	..	..
42-42.9	..	..	..	..	..	..	1.95	1.64	..	..	..	..	..	..	..	..	..	..	..	..

KETTLEMAN HILLS—55 degree Gravity and above $1.65 per barrel. *Union Oil Company. †Changed March 18, 1929.

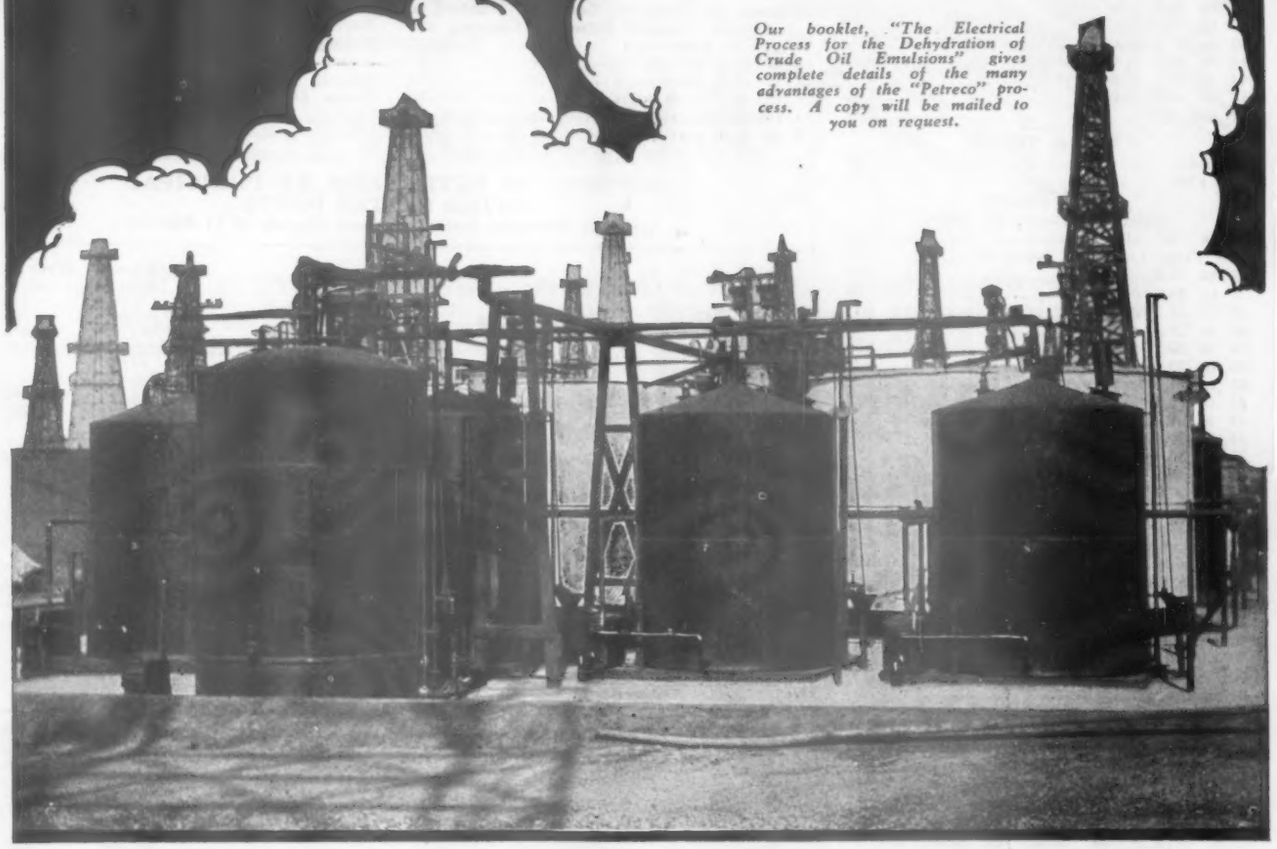
-minimum installation cost!

The total cost of a "Petreco" Electric Dehydrating Plant, including the necessary tankage for wet and cleaned oil, is less per barrel of capacity than that of any other known process for treating crude oil emulsions.

PETROLEUM RECTIFYING COMPANY of CALIFORNIA

Security Title Insurance Bldg. 530 West 6th Street, Los Angeles, Calif.
Petroleum Bldg. Houston, Texas

Our booklet, "The Electrical Process for the Dehydration of Crude Oil Emulsions" gives complete details of the many advantages of the "Petreco" process. A copy will be mailed to you on request.



"PETRECO"
ELECTRIC DEHYDRATORS

Say you saw it in The OIL WEEKLY

CRUDE OIL PRICE QUOTATIONS (*Continued from Page 42*)

(Magnolia Petroleum Company)
(Effective January 24, 1929)

Mitchell County	$ .65
Howard-Glasscock County (shallow)	.65
Howard-Glasscock County (deep)	.65

Col-Tex Refining Company

Howard and Mitchell Counties	$ .80

MARKHAM
The Texas Company
(Effective January 30, 1929)

All grades	.90

LULING

All grades	.80

NORTH AND CENTRAL TEXAS
Effective January 24, 1929)
Ranger, North Texas, Mexia, Powell, Richland, Wortham, Currie, Moran, Nocona and Lytton Springs Crude
(Humble Oil and Refining Company)

Below 25	.60
25 to 25.9 gravity	.66
26 to 26.9 gravity	.72
27 to 27.9 gravity	.78
28 to 28.9 gravity	.84
29 to 29.9 gravity	.90
30 to 30.9 gravity	.96
31 to 31.9 gravity	1.02
32 to 32.9 gravity	1.08
33 to 33.9 gravity	1.11
34 to 34.9 gravity	1.14
35 to 35.9 gravity	1.17
36 to 36.9 gravity	1.20
37 to 37.9 gravity	1.23
38 to 38.9 gravity	1.26
39 to 39.9 gravity	1.29
40 to 40.9 gravity	1.32
41 to 41.9 gravity	1.35
42 to 42.9 gravity	1.38
43 to 43.9 gravity	1.41
44 and above	1.44

SOUTH TEXAS

Mirando	.80
Salt Flat	1.00

GULF COAST
(Effective January 26, 1929)

Grade "A" all companies	1.20
Gulf Coast Light Oil, below 25	1.05
25 to 25.9 gravity	1.07
26 to 26.9 gravity	1.09
27 to 27.9 gravity	1.11
28 to 28.9 gravity	1.13
29 to 29.9 gravity	1.15
30 to 30.9 gravity	1.17
31 to 31.9 gravity	1.19
32 to 32.9 gravity	1.21
33 to 33.9 gravity	1.23
34 to 34.9 gravity	1.25
35 to 35.9 gravity	1.27
36 to 36.9 gravity	1.29
37 to 37.9 gravity	1.31
38 to 38.9 gravity	1.33
39 to 39.9 gravity	1.35
40 and above	1.37

*Humble Oil & Refining Company's postings on Gulf Coast Light stop at 35 to 35.9. Its price on all crudes above 35 to $1.37 per barrel.

Magnolia Petroleum Company's postings stop at 31 to 31.9.

SOMERSET
Grayburg

Below 33 gravity	1.05
33 to 33.9 gravity	1.07
34 to 34.9 gravity	1.09
35 to 35.9 gravity	1.11
36 to 36.9 gravity	1.13
37 to 37.9 gravity	1.15
38 and above	1.17

WYOMING-MONTANA
(Effective January 25, 1929)
Wyoming

Byron	1.33
Ferris	1.60
Elk Basin	1.36
Grass Creek	1.36
Rock Creek	1.18
Lost Soldier	.95
Lance Creek	1.38
Mule Creek	1.10
Notches	.65
Big Muddy	1.28
Osage	1.38
Hamilton Dome	.85
Pilot Butte	1.75
Torchlight-Greybull	1.48
Lander	.80
Rex Lake	1.10
South Casper Creek-Poison Spider	1.00

Salt Creek
Midwest Refining Company

29 to 29.9 gravity	.90
30 to 30.9 gravity	.96
31 to 31.9 gravity	1.02
32 to 32.9 gravity	1.08
33 to 33.9 gravity	1.11
34 to 34.9 gravity	1.14
35 to 35.9 gravity	1.17
36 to 36.9 gravity	1.20
37 and above	1.23

MONTANA

Sunburst	$1.65
Cat Creek	1.48
Lake Basin	2.20

NEW MEXICO

Artesia	1.08
Hogback	1.43
*Lea County	.65

The Texas Co.

CANADA
(Effective April 26, 1929)

Oil Springs	2.12
Petrolia	2.05

LOUISIANA-ARKANSAS
(Effective January 26, 1929)
Homer, Haynesville, Caddo, El Dorado, De Soto and Crichton and Cotton Valley*
(Atlantic Oil Producing Company, Standard of Louisiana, Magnolia Petroleum Company and The Texas Company.)

27 to 27.9 gravity	.78
28 to 28.9 gravity	.84
29 to 29.9 gravity	.90
30 to 30.9 gravity	.96
31 to 31.9 gravity	1.02
32 to 32.9 gravity	1.08
33 to 33.9 gravity	1.11
34 to 34.9 gravity	1.14
35 to 35.9 gravity	1.17
36 to 36.9 gravity	1.20
37 to 37.9 gravity	1.23
38 to 38.9 gravity	1.26
39 to 39.9 gravity	1.29
40 to 40.9 gravity	1.32
41 to 41.9 gravity	1.35
42 to 42.9 gravity	1.38
43 to 43.9 gravity	1.41
44 gravity and above	1.44

*Shreveport-Eldorado's postings stop at above 40 gravity.

The posting on Cotton Valley is same as Caddo. From 36 to 52 and above the regular gravity schedule is followed.

The Texas Company pays North Texas gravity scale in North Louisiana.

STEPHENS
(All Companies)

Below 28 gravity	.70
28 to 28.9 gravity	.74
29 to 29.9 gravity	.78
30 to 30.9 gravity	.82
31 to 31.9 gravity	.86
32 gravity and above	.90

SMACKOVER
(All Companies)

Below 24 gravity	.75
24 and above	.90
Bellevue	1.25
Jennings	1.15
Vinton	1.30
Edgerly	1.30
Starks Dome	1.30
Urania	1.00
Calion	.75

IMPORTS OF PETROLEUM AT PRINCIPAL UNITED STATES PORTS

American Petroleum Institute Figures (Barrels of 42 Gallons)

	Week Ended April 27	Week Ended April 20
AT ATLANTIC COAST PORTS—		
Baltimore	71,000	219,000
Boston	143,000	335,000
New York	1,092,000	*945,000
Philadelphia	125,000	543,000
Others	84,000	.....
Total	1,515,000	2,042,000
Daily Average	215,429	291,714
AT GULF COAST PORTS—		
Galveston District	67,000	.....
New Orleans and Baton Rouge	184,000	142,000
Port Arthur and Sabine District	246,000	.....
Tampa	.....	.....
Total	497,000	142,000
Daily Average	71,000	20,286
AT ALL UNITED STATES PORTS—		
Total	2,012,000	2,184,000
Daily Average	287,429	312,000
Daily Average Four Weeks Ended	299,786	321,500

RECEIPTS OF CALIFORNIA OIL AT ATLANTIC AND GULF COAST PORTS

American Petroleum Institute Figures (Barrels of 42 Gallons)

	Week Ended April 27	Week Ended April 20
AT ATLANTIC COAST PORTS—		
Baltimore	78,000	78,000
Boston	.....	.....
New York	330,000	150,000
Philadelphia	.....	197,000
Others	.....	.....
Total	408,000	425,000
Daily Average	58,286	60,714
AT GULF COAST PORTS—		
Total	.....	.....
Daily Average	.....	.....
AT ATLANTIC AND GULF COAST PORTS—		
Total	408,000	425,000
Daily Average	58,286	60,714
Daily Average Four Weeks Ended	57,321	73,535
Distribution of Total California Oil Receipts is as follows:		
Crude	.....	.....
Gasoline	408,000	365,000
Gas Oil	.....	70,000
Total	408,000	425,000

*—Revised.

It's *there* when you need it!

...*It's a great comfort* **to be driving with Sinclair H-C Gasoline—because you know that right there under the accelerator is POWER—*instant, dependable* POWER—awaiting the touch of your foot to take you out of traffic jams safely, easily, quickly.**

H-C is the High Compression gasoline that everybody is talking about. For better low gear performance, for top speed and power without a knock, for economical mileage—*you can't equal H-C Gasoline.* It gives High Compression performance in new or old engines of any type.

H-C runs your engine cooler—reduces vibration—lessens engine strain—gives better combustion and allows your engine to operate at its maximum compression and deliver its full power under all engine conditions. H-C is all gasoline, *without any foreign content*—and there never was a gas like it.

The properties which eliminate knocking are in this extraordinary gasoline—not in some added substance. H-C is the correct answer to your question: "What gas shall I use to keep the knock out of my cylinders?" Just try it—wherever you see the silver-like H-C pump.

The better all-year High Compression Anti-Knock fuel for all engines!

SINCLAIR H-C GASOLINE

STOPS KNOCKS

SINCLAIR REFINING COMPANY, INC., 45 NASSAU STREET, NEW YORK ATLANTA BOSTON CHICAGO HOUSTON KANSAS CITY

Say you saw it in The OIL WEEKLY

THE ROMANCE OF OIL

(Number Three of a Series)

The Boom Town

. . . . . here she goes, how they fall, nobody knows."

Some barker sets up his tricks. Alongside opens up a hamburger stand. A landowner turns up to effect a lease, drives a few stakes to indicate the direction of a street . . . . and an oil field town comes into being.

Nobody knows why one site becomes a boom town and another fails to strike. It might be due to a lucky name, the location of a supply store, the personality of a cafe owner or the wisecracks of a popular waitress. Only this is known. Logic has nothing to do with it.

When the accepted townsite does become established in come cafes, cot houses, clothing stores, cafes, drink emporiums, dance halls, cafes, general merchandise stores, billiard halls, hotels, movie palaces and cafes.

Only slightly less noisy than the old cattle town and as picturesque as the movie version of the mining camps, the oil field town draws more water than both of them put together.

Wealthier men walk the streets or drive through the dust or mud, more skilled workmen ply the tools, more organization rules the works, more wealth is at stake.

For the oil field town, though haphazard in its location, has plan and purpose in its development.

HERCULES SUPPLY COMPANY

J·T·McCARTHY JR

EVERYTHING FOR OIL WELLS

At Wink and at other places the Hercules Store occupies a prominent position in the town. Ready accessibility for the oil field worker is part and purpose of the Hercules plan. And when you are once in a Hercules Store you can find most anything needed on the derrick floor, equipment, repair parts and tools that are used as standard in the field.

American Wire Lines . Lucey Rotary Products . Etna Tubular Products . Standard Seamless Tubular Goods Guiberson Tubing Catchers and Swabs . Hughes Tool Co. Products . Goodrich Packing and Belting . Baker Casing Shoe Products . Bettis Protectors . Walworth and Crane Valves . Hundreds of other lines and items in stock in every Hercules Store.

Stores: Merkel, Pyote (Wink) General Offices, FORT WORTH *Borger, Vernon (Grayback Crossing)*

United States Daily Average Production

Figures below are taken from the complete revised estimates of the AMERICAN PETROLEUM INSTITUTE except for the current week, which are advance estimates issued by the A. P. I. and are subject to revision:

1928	Oklahoma	Kansas	Texas (Outside Gulf Coast)	Gulf Coast	North Louisiana	Arkansas	Eastern States	Rocky Mountain	California	United States Daily Ave.	United States Total
January	675,450	108,300	523,300	125,450	45,250	90,050	109,600	77,000	617,100	2,371,500	73,516,500
February	664,450	110,550	538,750	115,800	45,300	88,250	104,850	75,550	614,750	2,358,250	68,388,850
March	646,850	112,250	575,850	119,900	44,400	85,600	102,150	78,700	617,450	2,383,150	73,877,650
April	620,450	112,150	617,850	118,850	46,900	83,450	107,000	78,500	613,550	2,398,700	71,961,100
May	610,100	108,750	561,450	129,850	43,600	91,250	112,100	82,200	630,900	2,370,200	73,476,300
June	594,850	105,200	554,400	135,400	42,350	102,850	109,300	82,400	643,400	2,370,150	71,104,500
July	587,150	102,750	597,250	133,650	42,150	90,700	113,400	80,400	644,700	2,392,150	74,156,600
August	656,350	102,200	604,000	130,200	40,200	87,500	113,300	77,700	634,150	2,445,600	75,534,600
September	724,850	99,750	604,150	129,500	39,050	84,700	112,550	78,850	631,650	2,505,050	75,151,500
October	741,350	97,900	598,550	129,950	38,800	83,550	114,000	83,300	624,450	2,511,850	77,867,800
November	715,750	96,600	586,350	135,100	38,600	83,000	109,700	81,150	653,050	2,499,300	74,978,300
December	710,600	97,200	603,700	135,050	37,300	81,350	113,450	74,600	697,850	2,551,100	79,084,400
1929											
January	722,550	97,150	632,500	136,750	36,650	78,600	111,950	73,200	747,250	2,635,600	81,703,600
February	714,800	95,950	643,350	142,300	35,700	74,600	108,550	71,750	797,800	2,684,800	75,204,400
March	666,500	95,500	662,500	147,750	35,800	74,250	108,850	70,400	786,000	2,647,400	82,068,350
April 6	673,700	97,850	668,250	150,850	35,500	73,100	110,250	71,350	777,200	2,658,100	18,606,700
April 13	648,400	105,350	644,700	154,500	35,600	72,800	110,500	67,100	776,200	2,615,050	18,305,350
April 20	673,700	109,100	649,300	150,450	35,600	73,500	110,750	72,950	796,600	2,671,850	18,702,950
April 27	663,300	109,850	645,550	159,250	35,650	72,300	111,250	65,800	787,700	2,650,650	18,554,550
May 4	676,100	111,650	639,150	160,550	35,450	72,550	112,000	71,200	751,200	2,629,850	18,408,950
Increase	12,800	1,800	.....	1,300	.....	250	750	5,400	.....	.....	.....
Decrease	.....	.....	.....	6,400	.....	200	.....	.....	36,500	20,800	145,600

TEXAS
(Outside Gulf Coast)

PANHANDLE DISTRICT

	May 4	April 27
Carson County	6,800	6,550
Gray County	25,400	25,800
Hutchinson County	25,700	25,150
Wheeler County	650	650
Others	1,800	1,850
Total	60,350	60,000

NORTH TEXAS

Archer County	16,450	16,700
Burkburnett	8,800	8,950
Electra	12,500	12,700
Iowa Park-KMA	5,450	5,300
Montague and Cooke Cos.	13,150	13,000
Wilbarger	27,300	27,250
Others	500	500
Total	84,150	84,400

WEST CENTRAL TEXAS

Brown County	8,250	8,400
Callahan County	4,100	4,000
Coleman County	3,500	3,600
Eastland-Desdemona	6,200	6,500
Jack County	1,800	1,950
Palo Pinto County	400	400
Shackelford County	13,000	13,200
Stephens County	6,200	6,300
Throckmorton County	600	700
Young County	6,600	6,750
Others	700	700
Total	51,350	52,500

WEST TEXAS

Crane-Upton Counties	47,000	47,600
Crockett County	2,100	2,200
Howard and Glasscock Cos.	45,000	46,350
Jones County	5,200	5,650
Mitchell-Scurry Cos.	2,600	2,750
Pecos County	87,600	88,500
Reagan County	18,500	18,800
Winkler County	143,000	144,150
Others	2,100	2,200
Total	353,100	358,200

EAST CENTRAL TEXAS

Boggy Creek	2,800	2,800
Corsicana-Powell	7,950	8,000
Currie	500	500
Mexia	5,150	5,300
Nigger Creek	600	600
Richland	400	400
Wortham	1,000	1,100
Total	18,400	18,700

SOUTHWEST TEXAS

Dale	500	500
Laredo District	11,800	11,950
Luling	11,900	12,000
Lytton Springs	1,000	1,000
Somerset	1,450	1,300
Salt Flat	40,900	40,450
Others	4,250	4,550
Total	71,800	71,750
T'tl Tex. (Outside Gulf Coast)	639,150	645,550

TEXAS GULF COAST

Barbers Hill	8,850	9,450
Batson	1,500	1,500
Big Creek	2,700	2,900
Blue Ridge	4,250	4,000
Boling	1,900	2,000
Damon Mound	700	700
Goose Creek	6,100	6,100
Hull	9,000	9,100
Humble	11,700	7,400
Orange County	3,100	2,950
Pierce Junction	20,100	21,110
Raccoon Bend	3,500	3,650
Saratoga	1,000	1,000
Sour Lake	2,700	2,700
South Liberty	5,400	5,400
Spindle Top	31,200	32,600
Sugarland	12,400	11,000
West Columbia	6,400	6,500
Washington Co.	3,000	2,900
Others	4,350	4,650
Total	139,850	137,600
Texas Total	779,000	783,150

OKLAHOMA

Braman	3,400	3,400
Logan Co.	10,800	10,900
Blackwell	3,900	3,950
Hubbard	2,000	2,000
Thomas	800	800
Tonkawa	10,450	10,400
Garber	5,500	5,550
Burbank	20,850	20,950
Osage (outside Burbank)	24,800	24,850
Cushing	20,550	20,600
Yale Jennings	7,050	7,100
Davenport	1,500	1,500
Bristow Slick	19,600	19,650
North Okmulgee	13,650	13,700
Lyons Deaner	7,850	7,900
Cromwell	7,900	7,900
Papooose	3,350	3,350
Wewoka	4,900	4,900
Seminole	33,700	32,350
Bowlegs	34,450	32,950
Searight	11,900	11,550
Little River	78,250	72,350
Earlsboro	63,050	60,200
Duncan District	6,500	6,450
Graham	4,200	4,250
Fox	1,450	1,450
Healdton	13,000	13,050
Hewitt	8,100	8,100
Scholem Alechem	12,900	12,950
Pearson	2,000	2,200
St. Louis	99,250	99,750
Allen	25,700	25,750
Maud	28,650	28,900
Mission	31,950	30,300
Oklahoma City	3,100	3,250
Others	49,100	48,100
Total	676,100	663,300

CALIFORNIA

Santa Fe Springs	160,000	170,000
Long Beach	175,000	180,000
Huntington Beach	42,000	44,000
Torrance	13,500	14,000
Dominguez	10,300	10,500
Rosecrans	6,400	6,700
Inglewood	22,500	23,500
Midway-Sunset	72,500	72,500
Ventura Avenue	54,000	56,500
Seal Beach	36,000	41,000
Elwood-Goleta	30,000	35,000
Kettleman Hills	3,500	3,500
Others	125,500	130,500
Total	751,200	787,700

KANSAS

Greenwood County	20,150	20,100
Florence-Covert	1,000	1,000
Peabody-Ebling	2,750	2,750
Eldorado-Towanda	12,700	12,750
Augusta-Fox Bush	2,950	2,950
Rainbow Bend	1,000	1,000
Russell	3,250	3,300
Churchill	6,700	6,900
Oxford	5,050	5,050
Sedgwick	28,400	26,250
Others	27,700	27,800
Total	111,650	109,850

NORTH LOUISIANA

	May 4	April 27
Homer	4,000	4,050
Haynesville	5,350	5,350
Caddo Light	8,250	8,200
Caddo Heavy	3,200	3,250
DeSoto-Red River	3,900	3,900
Elm Grove	600	550
Bellevue	700	700
Cotton Valley	3,000	3,000
Urania	5,750	5,900
Pleasant Hill	450	500
Others	250	250
Totals North Louisiana	35,450	35,650

LOUISIANA GULF COAST

Bayou Bouillon	250	250
East Hackberry	2,800	2,650
Hackberry	3,700	4,350
Edgerly	850	800
Evangeline	900	800
Lockport	4,000	4,200
Sorrento	400	350
Sulphur Dome	2,900	3,300
Sweet Lake	400	400
Vinton	4,000	4,100
Others	500	500
Total Louisiana Gulf Coast	20,700	21,650
Louisiana Total	56,150	57,300

ARKANSAS

El Dorado	4,700	4,700
Champagnolle	8,850	8,650
Smackover Light	6,200	6,200
Smackover Heavy	49,100	49,100
Stephens	1,050	1,000
Nevada	1,200	1,200
Lisbon	1,350	1,350
Others	100	100
Total	72,550	72,300

MOUNTAIN STATES

WYOMING

Salt Creek	33,600	25,150
Grass Creek	2,150	2,250
Elk Basin	850	800
Big Muddy	2,350	2,400
Lost Soldier	3,300	3,300
Rock River	2,500	2,500
Lance Creek	300	250
Oregon Basin	2,350	2,350
La Barge	1,800	1,800
Others	3,700	3,350
Total	52,900	46,150

MONTANA

Cat Creek	1,400	1,400
Sunburst	6,500	6,500
Pondera	2,450	3,000
Others	100	100
Total	10,450	11,000

COLORADO

Moffats (Craig)	1,150	950
Fort Collins	2,500	2,450
Florence	900	1,050
Others	1,750	1,800
Total	6,300	6,250

NEW MEXICO

Table Mesa	...	...
Artesia	900	900
Hogback	250	250
Rattlesnake	...	850
Others	400	400
Total	1,550	2,400
Totals Mountain States	71,200	65,800

EASTERN STATES

(Including Ill., Ind., Ohio, W. Va., Pa., Ky., and N. Y.)	112,000	111,250

PRODUCTION SUMMARY

East of Rockies	1,807,450	1,797,150
Total U. S.	2,629,850	2,650,650

Latest Developments in Conservation

Yates Production Boosted to 100,000 Barrels by Commission

By H. H. KING
Staff Representative

FORT WORTH, Texas.—Allowable production in the Yates field is to be boosted to 100,000 barrels daily beginning May 10 as result of an increase of 12,500 barrels being approved by the proration advisory committee at the conclusion of a special meeting of the committee and operators here May 6. Formal recommendations to this effect will be forwarded immediately to the Texas Railroad Commission for approval along with the request that the commission issue an order extending proration enforcement in the field for another six months after the termination of the current period on July 1, 1929.

Sanction of the commission for a maximum allowance of 100,000 barrels daily was given January 12, after a hearing at Austin on the request of the Mid-Kansas Oil & Gas Company for increased runs for its pipe line subsidiary, the Illinois Pipe Line Company, subject to the approval of the proration advisory committee and assurance that no waste of oil and gas would be involved. Last January Mid-Kansas Oil & Gas Company asked that the output of the field be increased from 72,500 to 100,000 barrels daily in order that the Illinois Pipe Line Company increase its runs from 22,000 to 49,500 barrels daily to fulfill deliveries on existing contracts, and those in prospect, but owing to direct pipe line facilities to tidewater at Ingleside via the Illinois Pipe Line Company and Humble Pipe Line Company systems being unable to take care of the entire amount, only 15,000 barrels of the requested increase was taken up on February 1. Mid-Kansas Oil & Gas Company petitioned the advisory committee for the remainder of its quota April 16, but in the meantime other purchasers appeared on the scene with requests for additional oil for purchase also.

The meeting here Monday was largely to assure a continuation of proration enforcement beyond July 1, and to settle the controversy as to how the authorized 12,500 barrel increase by the commission should be distributed. Officials of Shell Petroleum Corporation requested that the pipe line runs of the Shell Pipe Line Company in the Yates field be increased from 12,500 to 32,500 barrels beginning about August 1, and representatives of The Texas Pipe Line Company applied for 10,000 barrels daily beginning about June 15, while the Simms Petroleum Company (Simms Oil Company) asked that it be allowed to fill 150,000 barrels of steel storage standing idle in the field by forfeiting about 4,500 barrels of its daily pipe line outlet during the period of storing oil. Humble Pipe Line Company and Gulf Pipe Line Company did not ask for increased pipe line runs, but the latter notified the committee that Gulf Pipe Line Company may later have need for the 2,500 barrels daily now being produced in the field by Gulf Production Company above the maximum runs of its carrier.

Watch Water

After analyzing the various requests, and discussing the conservation efforts accomplished in the field through restricted production, the committee announced that applications made by officials of Shell Petroleum Corporation and The Texas Company would be deferred until June, and possibly some action would be taken in time to allow these companies to run all or a portion of the oil desired at the beginning of the new proration period on July 1. In the meantime, close observation is to be made regarding water encroachment and the lowering of well pressure, if any, during the period that the field produces 100,000 barrels daily.

The committee voted to allow Mid-Kansas Oil & Gas Company the 12,500 barrel increase in runs, except 4,500 barrels daily during the period that Simms Petroleum Company will require to fill its idle tankage. This was done to prevent another purchaser and carrier serving the field from losing the 4,500 barrels daily now being run from the Simms Petroleum Company's leases. The latter concern applied for permission to begin storing oil late in April, and was scheduled to start storing May 1, but was held off until the meeting here Monday.

Beginning May 10, daily average pipe line runs from the Yates field are to be distributed as follows until July 1:

Company—	Daily Runs
Illinois Pipe Line Company	45,000
Humble Pipe Line Company	28,500
Shell Pipe Line Company	12,500
Gulf Pipe Line Company	9,500
Simms Petroleum Company, (Storage)	4,500
Total	100,000

The railroad commission was represented at the Monday meeting by R. D. Parker, chief supervisor of the oil and gas division, but before the session was concluded he was called away by the death of a member of his family. W. A. Moncrief, independent producer in the Yates field, and chairman of the proration advisory committee, presided. About 30 operators and representatives of producing units in the field attended the meeting.

Purchasers

The Yates field has experienced proration enforcement almost at the start of production in October, 1926, and is generally recognized as being the biggest known source of crude supply in the country. Only three crude purchasing agencies are now serving the field, being Humble Pipe Line Company, Shell Pipe Line Company and Mid-Kansas Oil & Gas Company, although Gulf Pipe Line Company is taking the major portion of its own production, while Grayburg Oil Company is having its allowance moved by the Illinois Pipe Line Company to Lytle station, near San Antonio, where Grayburg Oil Company's pipe line receives the oil for final delivery to its San Antonio plant. The Texas Pipe Line Company has a 12-inch carrier cutting across the east portion of the field that is to be completed to Houston shortly, from Jal, New Mexico, but has not made a connection, while The Texas Company is not a producer in the field.

According to figures released by Ray Richmond, umpire, the Yates field was

credited with an estimated potential of 4,856,967 barrels daily at the close of April from 304 producing wells located on 170.9 units of 100 acres or less. Only 39 wells in the field are showing water, according to this official report. The joint properties of Mid-Kansas Oil & Gas Company and Transcontinental Oil Company were credited with more than one-half of the above potential, with a total of 2,534,798 barrels daily, with an allowance of 40,567 barrels daily during the first half of May. Although these properties are owned on a 50-50 basis, Mid-Kansas Oil & Gas Company has exclusive rights on marketing the oil.

Leaking casing seats on one or more wells near the west bank of the Pecos River accompanied by porous upper formations has created an unusual oil seepage situation in the Yates field, and during April 82,543 barrels of this migratory oil was recovered by Grayburg Oil Company, Marland Production Company and the Mid-Kansas-Transcontinental Interests through "grass root" pumpers, pits and trenches. This "pickup" oil is not included in proration allowances of the finders, or included in the total output of the field, since failure to head it off from the Pecos river would soon destroy the usefulness of the water for stock as well as kill all fish in the stream. Seepage oil production prior to April is estimated at 104,789 barrels, making a total of 187,332 barrels recovered since late in October, 1928, when the oil began finding its way through the river bank.

During April, Grayburg Oil Company, which also owns the oil rights to the Pecos River bed, recovered 48,085 barrels of seepage oil from specially prepared trenches along the west side of the river bank abutting leases owned by Marland Production Company and Mid-Kansas-Transcontinental. The latter companies recovered 28,367 and 6091 barrels, respectively, during April, and because of the production increasing steps are being taken to halt the migration of the oil across their properties to the river bank proper. Marland Production Company is recovering about 1900 barrel daily from five pumpers and several small pits dug to depths ranging from 20 to 50 feet, and Mid-Kansas-Transcontinental has started about 12 shallow tests since May 1.

Marland Production Company proposes to dig a trench across the east edge of its lease near the river bank to trap the oil before it reaches the river bed lease, and opposition to this plan has been registered by the Grayburg Oil Company, so action has been deferred until a hearing can be had on the matter before the railroad commission.

Tulsa. — Phillips Petroleum Company and Fuhrman Petroleum Company have staked location for Raper 1, SW SE Section 33-8-5, south of the Maud and Carr City pools and northeast of the St. Louis field. The test is in a large unproven area lying between the three pools.

Winkler County Enters Second Year of Prorated Production

AUSTIN, Texas.—An official order calling for a continuation of proration enforcement in the Winkler County area, for another six months was issued by the Texas Railroad Commission at the conclusion of a formal hearing held here May 4. The meeting was attended by a number of lease owners as well as officials and engineers, representing larger companies operating in the county, and no opposition was registered against the commission's conservation efforts in restricting production. Winkler County is now allowed a maximum daily production of 150,000 barrels, and this output is to remain unchanged, according to the terms of the commission's order, until conditions dealing with conservation of oil and gas production justifies an upward, or downward revision.

The Winkler County area was completing its first year of proration enforcement on the day of the above hearing, and expert testimony was submitted to members of the commission as to the direct benefits that have been derived in the county by limiting oil production during the past 12 months. Clarence E. Gilmore, chairman of the commission, presided at the meeting. L. E. Barrows, manager of the Fort Worth division offices of The Texas Company and chairman of the Winkler County proration advisory committee, submitted a prepared statement requesting that proration be extended another six months in the interest of conservation, and R. Alsobrook, Winkler County proration umpire, testified as to the direct results being had in retarding water encroachment through proration restrictions, while charts and tables were shown as supporting evidence.

Testimony favoring a continuation of proration was also made by M. O. Boring, assistant production superintendent for Gulf Production Company in the Fort Worth division; A. B. Irion, production superintendent for the Southern Crude Oil Purchasing Company-Dixie Oil Company and R. A. Westbrook interests; H. C. Hardison, petroleum engineer, The California Company; E. G. Allen, division superintendent for the Shell Petroleum Corporation; and C. B. Temple, petroleum engineer for Humble Oil & Refining Company.

Although the practice of opening a number of wells in Winkler County bimonthly to determine potential production gauges for determining proration allowances has been gradually eliminated in recent months, because of operators electing to take a five to 10 per cent. cut from previous figure, the proration staff practically discontinued gauging of old wells beginning May 1. On this latter date the field was given a potential estimate of 2,008,389 barrels, as compared to 2,215,193 barrels on April 15, and a uniform cut of about 10 per cent. was given all of the 259 units on production as a move toward lowering the potential total. Plans are to cut each unit about five per cent. semi-monthly from now on, except when well owners have completed new producers, or re-conditioned old wells, although any lease owner will be privileged to open wells for a gauge whenever desired. The water situation in the Winkler County area has reached a stage that opening of wells for gauging has a harmful effect, while the release of accumulated rock pressure often restricts, or kills the natural flow of fluid for a period.

Second California Shut-In Order Takes in More Fields

LOS ANGELES.—Another 25,000 barrels was clipped off California production during the past week, bringing the total estimated curtailment under General Order No. 1 to 80,000 barrels. Flush production, the modest start toward pinching in wells by some operators and the natural decline of the older wells added to the confusion and made an accurate gauge of production almost impossible at the end of the week.

A few of the major operators got a slow start on General Order No. 1, while a few were off at the bell in an effort to comply to the letter with the provisions of the curtailment plan.

In the Long Beach field, one of the largest producers did not start curtailment until May 4, the day on which General Order No. 2 became effective. This company was offset by smaller operators who were in no hurry to cut back, but finally issued a company order to pinch in its wells. This decision brought the amount shut in at Long Beach to around 22,000 barrels, or more than 40 per cent. of the amount necessary to bring the field total to the necessary 140,000 barrels.

The question of cutting back pumping wells at Long Beach is causing some concern. In some quarters, it is believed that the pumping wells should stand a greater part of the total reduction, while the operators with only pumping wells are of a different opinion. It is expected that a further adjustment will be made during the month. A much higher percentage of oil is coming from pumping wells in this field than is ordinarily supposed.

Development of the deep zones in the Santa Fe Springs field makes curtailment a problem which changes from day to day. Company orders have been issued, following the umpire's order, and shut-in production now totals about 20,000 barrels. Shallow zone wells have been brought down to about the correct level,

but a much larger cut is necessary to bring the deep zone producers to the allowable figure.

Shut-in production in the Seal Beach field stands at about 14,000 barrels, giving the area the best cut-back percentage of all.

Shut-in production in several other fields showed an increase during the week, the totals on May 4 standing as follows: Brea-Olinda, 1000 barrels; Coyote, 1000 barrels; Dominguez, 300 barrels; Huntington Beach, 4000 barrels; Inglewood, 2600 barrels; Montebello, 400 barrels; Potrero, 200 barrels; Richfield, 1400 barrels; Torrance, 1100 barrels; Ventura, 6000 barrels; Whittier, 300 barrels, and miscellaneous, 5000 barrels.

New problems are arising daily and it is believed that another general order will be issued which will be more equitable. The question of pumping wells, versus flowing wells, and the percentage of the cuts applied to each is claiming the attention of the various committees.

An organization is being formed to help the umpire in his work. An office force will be required to attend to the various details.

Although no official announcement has been made, it is known that a number of prominent engineers are expected to work with the umpire.

Government Ruling Starts Operators Drilling

Casper, Wyo.—The necessity to validate government permits for oil and gas exploration within the shortest possible time has caused several operators in Wyoming, Colorado, and New Mexico, in particular, to start work on locations in the Rocky Mountain States.

The Producers & Refiners Corporation will drill three wells in the Frannie district, Northern Wyoming, two in Oregon Basin field, Northern Wyoming, two at Muskrat, in Central Wyoming, and two wildcat wells for which the location is not announced. The Texas Production Company's Wyoming tests will be two on Skelton Dome, where the company is already drilling a well, and two more on Alkali Butte, in Fremont County. The Mountain Fuel Supply Company, which is developing a gas reserve sufficient to supply the long pipe line into Utah from Southwestern Wyoming, will drill several wells in Southern Wyoming and Northern Colorado, the number and location not having been announced.

In Eddy County, New Mexico, the Midwest Refining Company has started two wells, Cook et al. have started one, Getty Oil Company is moving in for its Cook-Ironsides 1, and the Ohio Oil Company is moving in material for another. In Lea County Midwest Refining Company has started Fisher 16, and Cranfill & Reynolds have rig completed for Mayer 1. In San Juan County, Reserve Oil Company is drilling around 100 feet in Shaffer 2.

Because of the considerable amount of deeded land in Montana that state is not feeling the Interior Department's edict so keenly.

Hoover's Conservation Plan Approved

Washington, D. C.—Authority of the Secretary of the Interior, in carrying out President Hoover's oil policy to provide extensions of permits on the condition that drilling operation shall be postponed or suspended, is upheld in an opinion rendered May 6 by Attorney General William D. Mitchell, who had been asked by Secretary Wilbur to consider the legal phase of the department's plan.

The Attorney General was asked to render an opinion upon the question of whether the secretary is authorized to grant an extension of a permit for such a period that is expired within the maximum limit of the statute, with the condition that drilling operations be confined to a latter part of that period.

Analyzing the leasing act of 1920 and the extension act which followed, the Attorney General declared in his opinion that, "Since the extension acts do not require the permittee to do specific acts within specific times and the administrative practice has recognized that the permittee has discretion not incompatible with diligence as to the appointment of drilling work within the limit of the extension period, I am of the opinion that the secretary and the permittees may agree, or the secretary may grant an extension on condition that drilling operations shall be postponed or suspended, dependent on the circumstances of each case, leaving however, remaining within the extension period, adequate time to complete a well to the maximum depth required by the act of February 25, 1920, by the exercise of reasonable dilligence. This plan seems not inconsistent with the interpretation and administrative practice of the department; it accomplishes the object of the mineral leasing act both as regards the prevention of waste and the completion of a test well within the statutory time; and it secures to the permittee all of the substantial benefits of the extension act. I see no legal objection to it."

Measuring Large Volumes of Gas
(Continued from page 36)

interior of the pipe adjacent to the orifice. It is hoped, however, that before the conclusion of the committee's work arrangements can be made to study this point.

12—Viscosity of the Gas

This factor becomes of importance only in the case of small orifices with low pressure and low rates of flow, and the committee will probably not consider it necessary to investigate it, owing to the fact that for all practical purposes in the commercial measurement of large volumes of gas it would not apply.

The committee's efforts are now being concentrated on the investigation of the effect upon the coefficient of the value of d/D, the rate of flow, and the static pressure, as these three are the dominating ones. In spite of the vast amount of work already done, it will be necessary to continue the study another year before definite findings can be formulated and published.

From the above summary of factors affecting the coefficients of orifices it is believed that you will appreciate why it has not been possible for the committee to render a complete report up to the present time. The effects of the factors enumerated, both singly and in combination, render the problem so complex that continued study is necessary before the committee can give to the association a report of definite findings. The work so far done has shown that the existing tables are sufficiently correct to justify the delay in rendering the final report, especially when it is considered that at the conclusion of the committee's work its determinations will probably be accepted as a standard throughout the gas industry, thus making it essential that all of the data put out by the committee must be established beyond any doubt. As the work progresses it is found that this will require more extensive investigations than were originally planned.

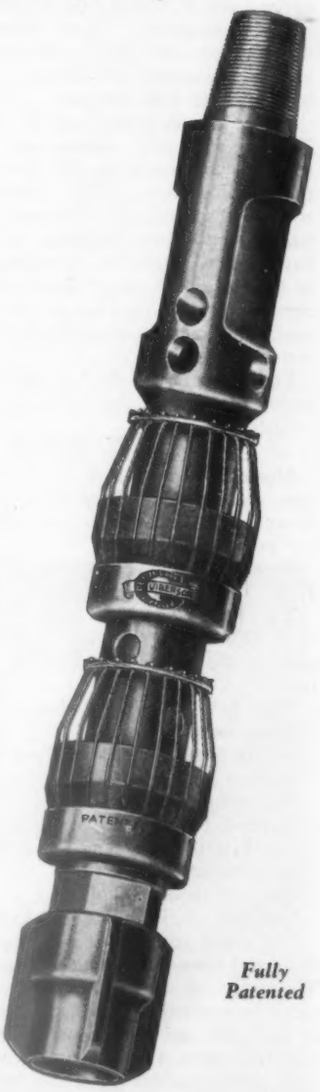
When the work is finished and the findings published it will probably be necessary to define a standard type of construction to which a given set of coefficients will apply under specified conditions of operation. It is hoped that the completion of the work planned for this year will permit the committee to publish a report which will give this information, even though the complete study of all of the factors enumerated may not have been made, and you can be assured that every effort is being made to push the investigation through as rapidly as is consistent with the high standard of work which the committee has set for itself and which the association demands.

We have been extremely fortunate in having the enthusiastic co-operation of the United States Bureau of Standards, the United States Bureau of Mines, the principal manufacturers of commercial meters and all of the gas company members of the association who have been asked to aid in the work, and we are assured that this co-operation will continue until the work is finally finished.

Tariff Fails

Washington.—Efforts of the oil industry to secure the imposition of an import duty on foreign oil and its products were found to be unsuccessful when the tariff bill was introduced in the house of representatives today by the Republican majority of the ways and means committee, providing for continued duty free entry of such products. Members of congress from the oil states made a determined effort to secure a duty of one dollar per barrel during the course of hearings before the committee, and Tuesday indicated that they would not cease their fight.

That Guiberson Swab would bring up the Devil and all his helpers, if we decided to go after 'em



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THESE boys are not slow to state their opinion of the Guiberson Swab. They say there is none to be compared with it. Left to right, they are: B. L. Watson, Tool-dresser; N. E. Earls, Head Roustabout and J. J. Spangler, Driller, photographed on the job at Bowlegs, Oklahoma.

Once a Guiberson Swab gets under a column of fluid, the fluid is coming up, and all of it—that's certain. The flexible cup construction, which makes a tighter seal the heavier the fluid, takes care of that. And it's easier for a Guiberson Swab to get under a column of fluid, because the flexible cups collapse with pressure from below, allowing the swab a speedy passage into the hole. Guide wires steer cup rims safely past all wrinkles and projections. One diameter cups will operate in two sizes of casing. Cup rubbers are made from specially prepared, slow deteriorating composition. The Guiberson Swab is doing most of the world's swabbing today.

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GUIBERSON

BETTER BE SAFE THAN SORRY

Straight Holes and Gas Lift on Engineers Program at Tulsa

TULSA.—The Mid-Continent section of the American Petroleum Institute Division of Development and Production Engineering will hold its spring meeting at the Mayo Hotel, Tulsa, May 28 and 29, 1929. There will be two subjects under discussion at this meeting: "Straight Hole Practice" and "Gas Lift Practice at Seminole."

The data to be included in these papers are to be obtained by requesting a group of men qualified by training and experience to answer in written form a questionaire dealing with each of the above questions. The answers are to deal with the practical rather than the theoretical phases of the subjects, but opinions are to be given if actual data is lacking.

The final papers will comprise a list of the questions and after each question will appear a summary of the data submitted in answer to that question. In this form the papers will be read at the meeting in Tulsa. After the papers are read, the subjects will be open for discussion by the meeting as a whole. Each question will be discussed in detail and as there will be only two subjects for the two day session, those in attendance should be able to obtain rather definite and complete pictures as to what constitutes good operating practices along the lines of these two subjects.

Following is the final program for the spring meeting of the division:

TUESDAY, MAY 28

Morning Session: 9 a. m.—Registration. (A fee of $2.00 will be charged to cover reporting services and other meeting expenses).

10 a. m.—Meeting called to order by J. R. McWilliams, chairman.

The following paper will be read by C. P. Dimit (Gypsy Oil Company), chairman of the Production Practice Committee:

"Gas Lift Practice at Seminole"
Compressor Plants,
Safety Methods and Appliances,
Surface Lines and Equipment,
Air and gas as a Lifting Medium
Natural Flow through Casing,
Gas Lift through Annular Space,
Intermittent Flow,
Gas Lift through Tubing,
Gas Lift vs. Swabbing and Pumping.

The paper consists of a series of questions and answers dealing with each topic. The questions were submitted to men directly connected with gas lift operations at Seminole and the answer to each question represents a summary of the experience and opinions of these men. The practical rather than the theoretical phases of the subject predominate throughout the paper. After the reading of the paper, each question will be open for detailed discussion.

Afternoon Session: 2 p. m.—Discussion—Gas Lift Practice at Seminole.

WEDNESDAY, MAY 29

Morning Session: 9:30 a. m.—Meeting called to order by W. K. Whiteford, vice-chairman.

The following paper will be read by Chas. Jacobson (Barnsdall Oil Company) chairman of the Drilling Practice Committee:

"Straight Hole Practice"
Weight Carried on Bit,
Mud Fluid,
Equipment,
Spudding In,
Costs and Speed,
Manual vs. Automatic Drilling Control,
Structural Influence on Direction of Bit.

This paper was prepared in the same general manner as the one on "Gas Lift Practice." The data contained in the paper was submitted by both drilling contractors and operators. The entire morning session will be devoted to the reading and discussion of this paper.

Meeting adjourned at 12 p. m.

General Entertainment

Tuesday Evening: Arrangements have been made with a local wrestling promoter to change the date of a wrestling bout between nationally known wrestlers to conform with this date. A sufficient number of desirable seats will be reserved for those who wish to attend.

Wednesday Afternoon: (Arrangements tentative) Visit to plant of the Spartan Aircraft Company to inspect methods of air plane manufacture.

Visit to Municipal Airport to view modern landing field. Tentative arrangements to secure planes for those who care to take a ride over Tulsa.

Golf tournament will be arranged if sufficient number desire to play.

Horse racing, Fair Grounds, at 2:30 p. m.

Ball Game—Tulsa vs Topeka at 3:30 p. m.

Humble Starts Harris County Wildcats

Houston.—Humble Oil & Refining Company has started two wildcat tests, one in Harris County and the other in Fort Bend County, each of which will be drilled possibly to 6000 feet. That in Harris County is O. P. Woodburn 1, located two miles south of Genoa in the August Whitlock survey, at a point 1850 feet south of the north line and 1320 feet east of the west line of the 633-acre Woodburn lease. Early this week a gas line was being strung and the test was rigging up. The test in Fort Bend County is the A. W. Miller 1, located three and one-half miles west and a little south of the town of Rosenberg; a rig is being moved in for that test.

Seminole Area Will Hold Inter-Company Safety Contest

SHAWNEE, Oklahoma. — Over 400 superintendents, foremen and employees of the producing, gasoline and pipe line departments of all companies operating in the Greater Seminole area were in attendance at the Petroleum Safety Banquet sponsored by the Mid-Continent Oil & Gas Association and the Mid-Continent division of the National Safety Council here May 6. Those in attendance were enthusiastic in the reception of the messages brought them by the speakers. J. Burr Gibbons, vice-president of Oil Well Improvements Company, acted as toastmaster. His speech concerning the importance of safety was interesting and of great value.

H. N. Blakeslee, representative of the National Safety Council, spoke interestingly on "Accident Prevention in the Producing Fields." F. W. Robson, division production engineer, Carter Oil Company, Seminole, read a thorough and valuable discussion of "Safe Operation of Air and Gas Lifts." Elmo D. Murphy, chairman Mid-Continent Division, National Safety Council and in charge of safety work for Mid-Continent Oil & Gas Company, discussed the "Theory and Application of Safety." Don J. Wallace, safety director, Mid-Continent Oil & Gas Association, presented a most interesting and impressive discussion of "Responsibilities in Foremanship."

The group of superintendents, foremen, supervisors, engineers and safety men decided upon a contest among companies operating in the Seminole area. Upon announcement of the proposed contest by Elmo D. Murphy, the idea was immediately endorsed by those present. This is a contest to effect lowering of accidents. A number of classes are provided for, such as producing, pipe line, gasoline, and transportation departments of each company. Every company represented at the meeting entered the contest in one or more classes. The winning departments of the companies will be presented with a suitable banner at the time of the petroleum exposition at Tulsa in October.

Rules governing the contest are to be mailed to contestants this week. It is planned that every department of every oil company in the Greater Seminole area shall be actively engaged in this friendly contest.

PERSONAL MENTION-MEN YOU KNOW

B. R. EMRICK

technical director over drilling and production, Burma Oil Company, as he prepared to take off from Houston to Dallas, May 4, Mr. Emrick sailed from Rangoon February 1 for a round-the-world trip, studying new equipment and field practices in general. While spending the major part of his tour visiting American fields, he will visit his company's holdings in Iraq, Persia and India en route home, and plans to leave New York in time to reach Burma late in September.

Born in Butler County, Pennsylvania, he has been closely associated with the industry practically all of his life and is the son of a pioneer, Eastern States operator. He joined Burma Oil Company 19 years ago, going to that country as a driller in the early spring of 1910.

Much of Mr. Emrick's traveling in America will be by airplane.

A. G. McMillan has been appointed superintendent of the Five Civilized Tribes with offices at Muskogee. McMillan entered the service in 1902 as stenographer with the Dawes commission in the allotting of land to members of the tribes. McMillan has served as assistant to Charles Ellis, acting superintendent, for some time.

James B. Russell, Jr., electrical engineer with the Gulf Production Company, Houston, was married to Miss Gladys Antoinette James on May 2, at the First Christian Church, Houston. Mr. and Mrs. Russell left for an overland trip to New Orleans, and sailed from there May 4 for Havana, Cuba. After May 20 they will be at home in Houston, at 1401 Wentworth.

A. A. Beard, vice-president and general manager for the past four years of the Tidal Oil Company has resigned, and plans to take a rest to restore his health before considering his future plans. He has been in the employe of the Tidal Oil Company for the past 14 years. E. H. Salrin, recently elected president, will act as general manager until a permanent successor is named to Mr. Beard.

Edwin A. Reckefus of Philadelphia, has arrived in Houston to be superintendent of the meter shop for the United Gas Engineering Corporation, which is the engineering subsidiary of United Gas Company, which is under Moody-Seagraves management. Mr. Reckefus was formerly with the John J. Griffin Meter Company in Philadelphia.

George Roeder, assistant to the general agent, Mexican Gulf Oil Company, after spending a vacation in Houston, has returned to Tampico.

K. B. Conway of the executive department of the Gulf Companies at Pittsburgh, was in Houston several days last week.

Edgar K. Duke, formerly in the auditing department of the Sun Oil Company at Philadelphia, is the new Tulsa office manager of that company.

Jack Manes has been made safety engineer for the Twin State Oil Company. Manes has been in the purchasing department for a number of years.

Tom Pew is now in charge of the air and gas departments of the Twin State Oil Company, with offices in Tulsa. Pew has been in charge of the air department but the gas department is a new position for him.

Sam H. Inman, 62, operator of Corsicana, Texas, died May 2, while en route to Brenham, where he was active in developing acreage. An inquest revealed that the car which he was driving ran into a ditch and turned over after he had suffered a heart attack.

M. A. Hardie, vice-president and general manager, Houston Gulf Gas Company, Houston, was last week appointed general manager of Dixie Gulf Gas Company, succeeding B. A. Harde, who, as executive vice-president of the company, has moved his office to Shreveport. Dixie Gulf Gas Company is a natural gas transportation subsidiary of United Gas Company. It was organized slightly more than a year ago to move gas from Western Louisiana and East Texas to Houston and other points in South and Central Texas.

M. A. Hardie has been directly affiliated with the natural gas industry since 1898, when he joined the United Natural Gas Company in Pennsylvania and New York. Reaching the position of district superintendent of that organization he resigned to go with the Canadian Western Natural Gas Company as operating superintendent, headquarters at Calgary, Canada. From that position he joined the Producers & Refiners Corporation in Wyoming, and later came to Houston as vice-president and general manager of Houston Gulf Gas Company.

B. A. Hardey's return to the Shreveport territory follows the United Gas Company's program of laying a 460-mile line from Monroe gas field of Northern Louisiana to St. Louis for delivering natural gas to the domestic and industrial trade.

M. A. HARDIE

News From California Fields

BRAD MILLS, *Staff Representative, Los Angeles, California*

Big Gas Well Wild Off Kettleman Hills

Los Angeles.—The big excitement of the week was the blowing in of Dudley Ridge Syndicate's well in Kings County, Sunday night for thirty-five million cubic feet of dry gas from 1305 feet through 10-inch casing with a pressure of 1000 pounds. This well is located in Section 12-23-19, about seven miles south of east of the Milham Exploration Company producer on Kettleman Hills. It is down in the flats entirely and off the Kettleman Hills structure. The well was still blowing Tuesday with the derrick down, but was throwing out shale and it was expected it would soon stop of its own accord, although engineers of the Union Oil Company were on the ground assisting the owners in efforts to kill.

The wild gasser drew attention from Kettleman Hills where 24 wells were drilling late last week, of which 11 were below 5000 feet. Nine rigs and locations indicate that something will have to be done very soon or the drilling campaign will reach still greater proportions. Committees are holding meetings to outline a conservation plan for Kettleman Hills and it is expected that a general meeting of all operators in that area will be called next week, or late this week, to pass upon a plan for restricting drilling. This plan is being worked out now by the special committee following a general meeting with all operators at which time individual expressions were heard.

If drilling is not stopped, or greatly restricted, several wells will be in the completion list, without unusual drilling troubles, within 60 days. The 11 wells mentioned only have about 2000 feet to drill before reaching depths where the sand is thought to be. Standard Oil Companw of California is drilling eight wells and reports four rigs. Milham Exploration Company is drilling three wells and Marland Oil Company three. Skelly Oil Company is also drilling two. There are now 12 operators busy in the field with many others holding leases or permits.

Shell Company Building in San Francisco

Shell Oil Company's new $3,000,000 San Francisco skyscraper is 380 feet high in 28 floors and represents one of the largest of the Shell buildings throughout the world.

The new building, planned to be ready for occupancy by May 1, 1930, will be headquarters for the exploration, production, refining and marketing activities of Shell Oil Company and will house the department in charge of research of the newly organized Shell Development Company and Shell Chemical Company. It will serve as Pacific Coast headquarters for the manufacture and distribution of the complete Shell products line.

Excavation will follow the present work of demolishing five small brick structures on the building site at Bush and Battery Streets. The location fronts 117 feet six inches on Bush and 137 feet six inches on Battery Street.

Construction will be of steel and re-enforced concrete, fire-proof, of a modern Gothic adaptation, and the building will be flood lighted at night.

A garage to accommodate 175 cars will be provided in the basement, sub-basement and rear portions of the first and mezzanine floors.

Lawndale

Los Angeles.—San Clemente Oil Company's Peck 2 was completed Monday at Lawndale for 1000 barrels of 30 gravity oil cutting only five per cent. with bottom of hole at 5915 feet. Nine-inch casing had been cemented at 5695 feet. This well is just south of the first well completed at Lawndale by the same company and has aroused renewed interest in this field where so many wells have been drilled on the strength of one lone producer without any luck. It had been freely predicted recently that the area would cost the California operators several million dollars.

Ventura Avenue

Los Angeles.—Associated Oil Company last week completed two new wells at Ventura Avenue for a combined production exceeding 5000 barrels. One well on the Lloyd lease was good for more than 4000 barrels, while the other, on the Hartman lease, started out at 1000 barrels.

Los Angeles.—Last week was quiet at Long Beach where only two new wells were completed, with total flush production of 4000 barrels. Drilling is not slowing down by any means, and production can be expected to hold up fairly well for several weeks.

Gasoline Plant Planned For Salt Flat

Luling, Texas.—Humble Oil & Refining Company plans to erect a plant for making casinghead gasoline from production in the Salt Flat field. It will be moved from Wortham, and will have an output of 12,000 to 15,000 gallons of gasoline daily.

Aqua Dulce Inactive

Houston.—Inasmuch as there is no pipe line outlet for the district, the Aqua Dulce gas area in western Nueces County is now inactive. Following the discovery of gas there in 1928, there was considerable activity; and a total of seven gas producers have been completed there. The Houston Oil Company drilled two producing wells there and discontinued operations; and the Aqua Dulce Oil & Gas Company, a subsidiary of the Moody-Seagraves organization, has to its credit five producers and one failure, including the discovery well, which was purchased from Grimm & Morris.

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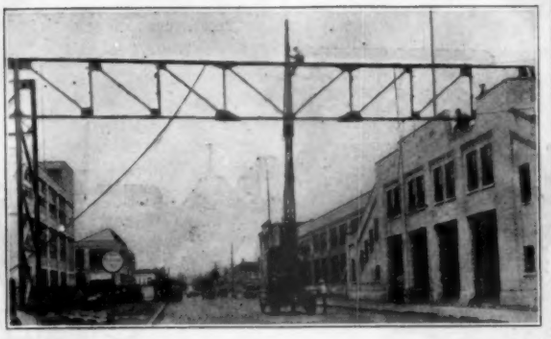

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Oklahoma--Kansas Field Notes

WARREN BAKER, *Staff Representative, Tulsa, Oklahoma*

Two Pottawatomie County Areas Increasing Activity

TULSA. — Completions for the past week in Oklahoma were lacking color and as a result attention of the oil operators continued to rest in the Kelly and Asher districts of Pottawatomie County.

In the Kelly area, the discovery well, Kelly 1, SE NE NE Section 2-7-4, north of St. Louis, showed a steady drop in production and the last of the week was producing 1100 barrels.

Indications are that a line fight may develop in the district. Nine derricks are up in the area and during the next couple of weeks many more are expected to be started. The quarter section in which the well is located is divided into small tracts as are some of the neighboring pieces.

At Asher, Simms Petroleum Company's Laster 1, SEc NE NE Section 19-6-4e, jumped to a new peak recovery when it was agitated 2½ hours. The well did 3640 barrels, an increase of 500 barrels. The following 24 hours it was not agitated and produced 3555 barrels.

Apparently the drilling campaign in this region will be even greater than in the Kelly vicinity. Twenty-five locations have been announced, including some on the Asher townsite, and others are due to be staked.

The performance of the discovery well has been more than generally expected. The fact that it is a lime producer caused many to be skeptical of it, together with the fact that it is on the Arbuckle Mountain uplift. Opinion continues to differ as to the producing horizon, with the belief growing that it has probably penetrated the Simpson.

Promising Wildcat Finds Water

The promising wildcat test of Tidal Oil-Twin State Oil-Simms Oil-Gardner Petroleum Companies' on the Halverson farm, in Section 31-5n-2e, McClain County, has found water. The top of the Wilcox sand was encountered at 4284 feet with some water at 4286 feet. At 4290 feet, total depth, it had filled up with salt water. It is shut down for orders.

Tulsa. — Gypsy Oil Company's wildcat test, Williams 1, southwest of Caldwell, Sumner County, Kansas, in Section 16-35-3w, was opened up and produced 110 barrels the first hour, 47 barrels the second, and 40 barrels the third hour, after which it quit flowing. It will be allowed to set for 24 hours to see if it heads up and flows; following which it may be deepened. Drilling this test has caused unusually active lease play in western and northwestern Grant County acreage.

This test, located on a 6700-acre community block, has been the center of much attention for the past couple of weeks. Geologically it was running high. The top of the Viola lime was found at 3989 feet, with the Simpson at 4124 feet. Two short fishing jobs just ahead of it penetrating the Wilcox sand caused but a little delay.

Indian Territory Illuminating Oil Company's wildcat on the Peterson farm, in SE SW NW Section 24-7-5, east of the St. Louis field, topped the Viola lime at 4188 feet, then went into the Simpson sand at 4230 feet. Total depth is 4300 feet, still in the Simpson, with no show.

Sunday Shutdown Not as Effectively

Oklahoma oil companies following the Sunday shutdown plan are not following that course as rigidly as in the past. This is shown by the fact that on Sunday, May 5, there was a drop of only 30,800 barrels over Saturday. In many instances the difference has run around 80,000 barrels. Prairie Oil & Gas Company did not shut down at Little River last Sunday, which accounted for part of the increase in Sunday runs. Atlantic Oil Producing Company, Barnsdall Oil Company, Continental Oil Company, Mid-Continent Petroleum Corporation, Magnolia Petroleum Company, Prairie Oil & Gas Company, Shaffer Oil & Refining Company, Shell Petroleum Corporation and Tidal Oil Company were the ones to shut down last Sunday.

Oklahoma City News

The fifth gas well to be drilled in at Oklahoma City is the Coline Oil Company's Olds 2, C NE NW Section 24-11-3w, north of the discovery well. The well is good for 65,000,000 feet of dry gas from 4852-62 feet, which is the upper part of the Layton series. It is the second producer from this particular horizon.

The discovery producer, Indian Territory Illuminating Oil Company and Foster Petroleum Company's Fee 1, C SE SE Section 24-11-4w, is still declining in oil output and showing an increase in its water recovery. The well gauged 2969 barrels of oil and 533 barrels of water the last of the week.

Seminole 9000 Barrels Down on Guage

Tulsa.—Greater Seminole field was opened on April 30, for a potential gauge and registered an output of 456,-133 barrels. This is a decrease of approximately 9,000 barrels over the open flow taken two weeks previous.

The allowed production for the period May 1 to 15 will be the same as it has been heretofore, namely 75 per cent. of the open flow.

The potential gauges were as follow:s

	Barrels
Little River	92,550
Carr City	16,105
Maud	17,439
Mission	39,894
Bowlegs	42,695
Earlsboro	74,881
Seminole	42,130
Seminole Sup	1,440
Searight	13,767
St. Louis	115,231
Total	456,133

Western Kansas Wildcat Making Gas, Will Increase Exploration

WICHITA, Kan.—British American Oil Company's rank wildcat test in SEc Section 31-25-17w, southeast of the town of Kinsley, in Edwards County, Western Kansas, featured Kansas activity of the past week. This well has a total depth of 4545 feet, where it is estimated at 10,000,000 to 20,000,000 feet of gas and spraying considerable oil. There is some discussion as to the pay horizon, but it is generally termed the conglomerate, which lies just above the Mississippi lime.

This test, which has the earmarks of developing into a good oil producer, means much to the development of far Western Kansas, regardless of whether its oil flow increases to commercial quantities. Increased exploration, both for oil and gas, are certain to result.

Due to Test Sumner Well

Gypsy Oil Company plans to make an immediate test of Williams 1, recently completed producer in Section 16-35-3w, along the Oklahoma-Kansas line, in Sumner County. This well has been pinched to 300 barrels daily since drilling in to a depth of 4782 feet, where it flowed 70 barrels the first hour. The test will tell much that is lacking about the important new strike. Many operators still remain skeptical over the area due to past performances having been flashy but soon passing out of the picture.

A log of this well showed a hole full of water at 3245-3395 feet, with a second batch of water at 3680-3712 feet. Two million feet of gas was found from 4408-15 feet, with a show of oil from 4415-28 feet. Three million feet of gas was encountered at 4435-37 feet. The top of the Viola lime was 4745 feet, with the five-inch casing set at 4760 feet in the Viola lime. The Viola was dry from 4768-78 feet. At 4778 feet the first gas and oil showed, when deepened to 4782 feet the well made 480 barrels in 11 hours, pinched part of the time.

Lygrisse Well Deepened

Shell Petroleum Company's Lygrisse 1, SEc NE Section 16-25-2e, stood out among Sedgwick County operations. The bottom of the hole was carried to 3174 feet and resulted in a nice increase in the output. It is now slightly below 2000 barrels daily.

In this same area H. H. Patton and L. H. Wentz's Swanson 1, NWc NE Section 6-26-2e, swabbed 984 barrels in 19½ hours during which time it was agitated 1½ hours. The swabbing carried the oil down to 200 feet of the bottom, after which it refilled 700 feet in two hours. The well made about 100 barrels of water along with the oil. The gravity is 39.7 from 3005-10 feet.

Principal interest at Valley Center was the Marland-Gypsy-Bu-Vi-Bar's Wright 4, SEc NE Section 12-26-1w, north of the Wright discovery well toward the Valley Center development. This well produced 604 barrels the first seven hours on the swab from the Simpson dolomite pay at 3366-74 feet. Later the well produced 1675 barrels in 22 hours.

South of Wichita, Shell Petroleum Corporation and Dickey & Shawver's Robbins 1, NWc SW Section 21-28-1e, produced as high as 552 barrels on a 24-hour test. At the same time the gravity of the oil increased to 45 degrees. A number of offset tests are ready to commence drilling.

Marland Production Company has decided to make a deep test of Westerfield 1, NW SE SW Section 16-25-1e, south offset to this company's Goodrich 1, discovery well of the Goodrich field. The Westerfield found water in the regular Goodrich area pay and at 3331-35 feet in the Simpson dolomite had 100 barrels per day. Since it is going below the Wilcox sand, this test will be a very interesting one.

McPherson Well Still Fishing

Ted Washabaugh's Vosshell 1, NW NE NE Section 9-21-3w, first oil well in the Wilcox series of McPherson County, continues to fish for the casing dropped in the hole. The well is three feet in the pay at 3304 feet, where swabbing fails to lower the level of the fluid. It has more than 30 feet of cavings in the hole but still capable of producing from 5 to 10 barrels hourly. The oil is 37 gravity.

Another Producer at Hillsboro

Darby Petroleum Company's No. 3, SE NE SE Section 12-19-2e, in the Hillsboro district of Marion County, found the Viola lime from 2805-26 feet and filled up 1000 feet with oil in the first six hours.

Fort Worth Meeting of Scouts Being Arranged

Fort Worth, Texas.—Members of the National Oil Scouts Association of America will be entertained with a barbecue and dance at Lake Worth Casino when the sixth annual meeting is held here May 20 and 21. This feature has been booked for the evening of the 20th, while the local entertainment committee has arranged a golf tournament for the following afternoon, with Texas League baseball tickets available for those not participating in the former sport. The annual ball will take place at The Texas Hotel, May 21, with a number of acts of professional vaudeville also carded.

A greater number of papers have been contributed by scouts for the business sessions of the association, and a review of the important developments transpiring within the past year in all Southwestern fields will be fully covered by these papers, which will be distributed in printed form as usual to members. The Scouts' new monthly publication, which was recently authorized by the executive committee, will make its initial appearance at this convention. R. T. Lutz, scout for Humble Oil & Refining Company, Wichita Falls, is editing the magazine, which is to be known as the Swab.

Plan Comprehensive Oil Library at Tulsa

Tulsa.—Directors of the International Petroleum Exposition are now inaugurating a movement to establish in Tulsa the best collection of books on all phases of the petroleum business in the world. Plans of the library were outlined to prominent geologists by J. Monte Hayner, chairman of the finance committee of the exposition. Additional conferences will be held with oil executives and financiers after which a tentative program will be planned.

Preliminary plans are to locate the library in Tulsa. The huge new library building to be erected on the campus of the University of Tulsa has been mentioned as the site, but nothing definite has taken place toward placing it there.

Oklahoma County

Tulsa.—Preparations have been completed for drilling deeper the Cromwell-Franklin Thompson 1, SW SE SE Section 15-12-3w, north of the state capitol at Oklahoma City and the deepest hole ever drilled in the state. Special 3½-inch drill pipe has arrived and the well is ready to go ahead.

Total depth of the hole is 7180 feet in the second break of the Wilcox sand, with nothing showing. A good showing of oil was found in the first break. The well has been drilled most of the way by rotary tools and when drilling is resumed the rotary will still be in use.

Oklahoma Proration

Tulsa.—Steps are being taken by Umpire Ray M. Collins to secure a hearing before May 15 with the State Corporation Commission for a statewide proration program in Oklahoma. This action follows the failure of the commission to extend the Greater Seminole shutdown plan beyond May 15 at a recent hearing.

A number of additional fields, including Oklahoma City, Asher, McCully and Allen would be included in the new program, which calls for a curtailment of production in all fields where the wells average 100 barrels daily each.

North and West Texas Field Notes

H. H. KING, *Staff Representative, Fort Worth, Texas*

Gasser Gives Winkler County New Theory on Production Trend

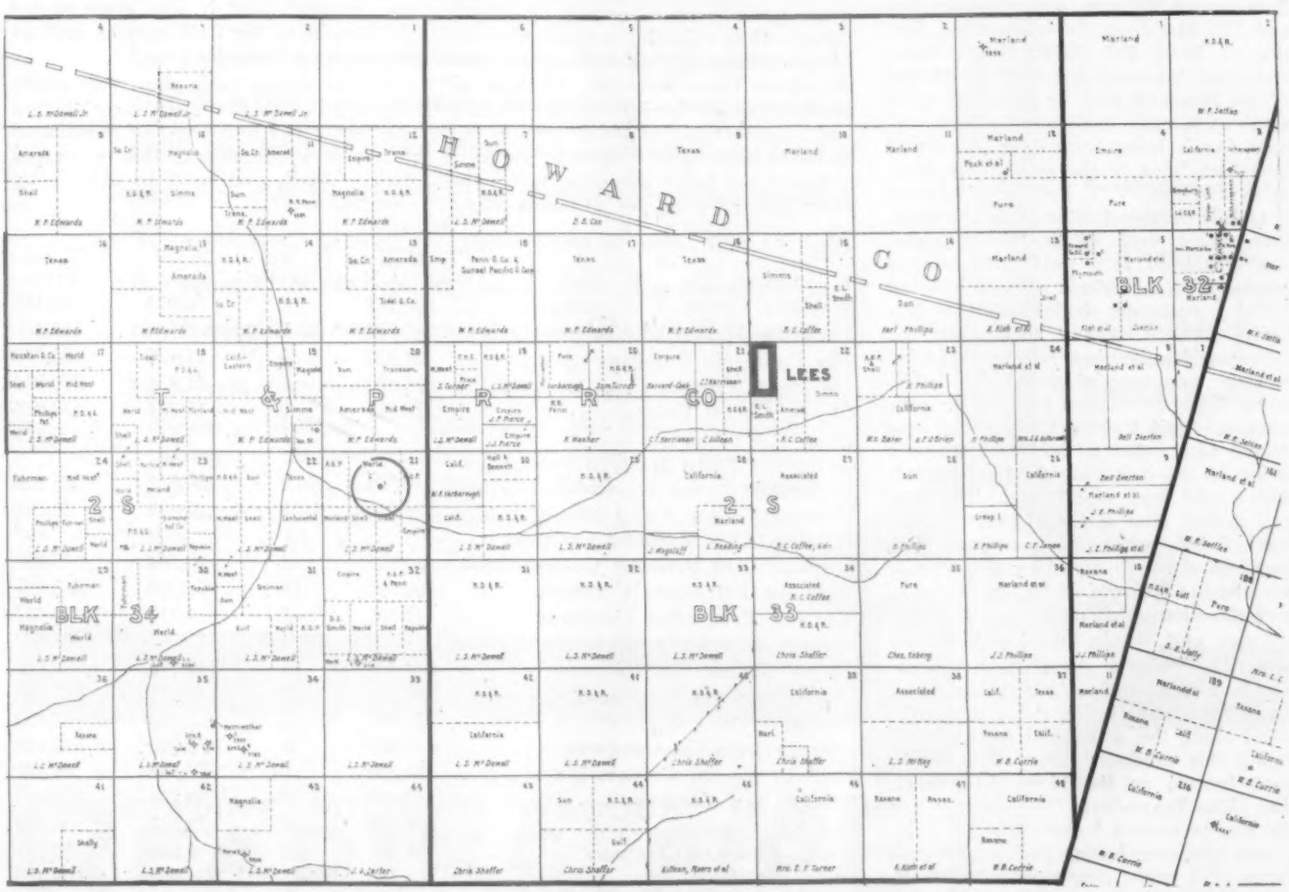
SAN ANGELO.—Generally accepted production trend theories in Winkler County were upset late Sunday when M. J. Bashara's wildcat test on acreage owned in fee, located north of Kermit, blew in as a gasser rated at fifteen million cubic feet daily, and caught fire while the crew was dodging the wreckage that followed in the wake of the tools being blown through the derrick. Efforts were being made to snuff out the flames Tuesday by shooting. Actual gauge of the gas flow may reveal a greater production than credited above.

Southwestern Drilling Company has the contract for the drilling of this wildcat, and the crew had made only about four feet of new hole after changing from rotary to cable tools when the gas blowout occured. Total depth now is estimated at 2481 feet.

Although lime tops are difficult to pick up in this general section of the county, the above gasser is credited with having logged top of the lime at 2450 feet, with a surface elevation of 2883 feet, thus making it unusually high on structure.

Glasscock County Wildcat

Pumping tests made Saturday and Monday on the World Oil Company's wildcat oil producer on the McDowell ranch, Glasscock County, were for only brief periods, and are not considered as being indicative of the possible production. This will was listed last week as slopping clean oil over top of eight-inch casing from lime pay at 2340 to 2398 feet, and on a two-hour test Saturday made 79 barrels of 27 gravity oil without lowering the fluid level. Pumping was resumed again Monday night, and the well is credited with having made 170 barrels in eight hours. The crew was engaged in the lowering position of the working barrel,



Above map shows lease ownership around World Oil Company's McDowell ranch discovery well in Glasscock County, and its relative position with the Settles pool, located seven miles to the northeast. Territory between these two areas is considered attractive for production, and considerable exploration work is assured

according to reports from the well late Tuesday, and several days may elapse before it is pumping regularly.

Humble Pipe Line Company has obtained the connection and is scheduled to complete early next week a seven-mile extension from its eight-inch trunk line system.

Since this wildcat producer is only seven miles southwest of the Settles pool there are possibilities of its being placed under proration rules now affecting lime horizon production in the Howard-Glasscock County district.

Deeper drilling was resorted to on two of the producers in the Shipley pool, Ward County, during the past week to try and increase production but without noticeable results. Shipley Oil Corporation's discovery well on the Hayzlett farm swabbed 95 barrels of oil Sunday after being deepened 25 feet to a total depth of 2506 feet, while J. H. L. Oil Company's Hayzlett 1 is swabbing 50 barrels daily after deepening from 2478 feet to 2513 feet. Atlantic Oil Producing Company and Delmar Oil Company's Hayzlett 1 is the best well in the pool, having been helped by a shot, and is averaging 230 barrels daily through two-inch tubing, at at total depth of 2506 feet.

The heavy gas flow encountered by M. J. Bashara's Fee 1 late Sunday is sufficiently removed from the nearest oil and gas production to be branded as a new area for north central Winkler County. It is located 900 feet from the south line and 2310 feet from the west line of Section 17, Block B-3, Public School lands, and about 4½ miles east of the north end of the Hendrick field, or about 1½ miles north of Kermit. Indications point favorably for it being located on a parallel lime high lying to the east of the Hendrick structure. V. T. Bolin et al's Brown et al 1, in Section 4, Block B-5, and about three miles south of the above gasser, was completed as a small pumper last summer at a total depth of 3211 feet, but failed to encounter shallow gas. The McGinley-Sigler Company took over the Boline wildcat late last January and tried to make a commercial pumper but failed, so the lease was turned back as per contract on April 1. The Bashara test was drilled with rotary to 2471 feet, where a string of 8¼-inch casing was cemented, with a total depth of 2477 feet. The crew had drilled plug and made only a few feet of hole when the heavy gas flow blew out the tools, wrecking the derrick, and the fire followed instantly. The surface elevation on this test is 2883 feet.

Lease and royalty trading has been active in vicinity of the World Oil Company's wildcat strike on the McDowell ranch in Glasscock County in a general trend along the seven-mile stretch separating this producer from the Settles pool, located on the Howard-Glasscock line. The Texas-State Oil Company was the first to stake a location near the discovery producer, having paid $10,000 cash for a 1/16 over-riding royalty to W. P. Edwards for lease on SE SE Section 19, Block 34, being about one mile northwest of production. A test is to be drilled immediately in the northeast corner of this 40-acre lease, giving Simms Oil Company and Amerada Petroleum Corporation direct offsets.

Rapid progress is being made by the Big Lake Oil Company on one of its four tests being drilled in the Big Lake field proper to try for production in the 8500-foot pay, and late last week University 131 had drilled past the 5900-foot level, with 8¼-inch casing cemented at 3470 feet. Group One Oil Corporation (Texon Oil & Land Company)'s discovery well of this record depth pay climbed to a near peak last week with a flow of 2532 barrels of 56° gravity (corrected) oil and 23,132,000 cubic feet of wet gas during the 24-hour period ending May 4, with 190 pounds back pressure. This deep well is producing from pay at 8500-23 feet.

Roberts-Settles Pool Production Below Proration Allowance

BIG SPRING, Texas.—Production from the deep pay horizons in the Roberts-Settles section of of the Howard-Glasscock County district remained below its proration quota of 37,500 barrels daily during April, with a total output of 1,082,539 barrels, or an average of 36,085 barrels daily. This deep pay production is coming from 111 pumping wells in the 2200, 2500 and 3000-foot horizons. Proration was officially applied to the field August 15, 1928, and from this date to the close of April the crude recovery from the deep pays amounts to 6,818,331 barrels, according to official figures compiled by E. E. Andrews, proration umpire. The total crude recovery prior to the proration enforcement period was in excess of 250,000 barrels, thus affording a total recovery of approximately 7,000,000 barrels from the above three horizons. Shallow oil production obtained from the Chalk and Clay sections of the district is not included in the above figures.

Based on brief pumping tests, the deep pay area in the Howard-Glasscock County district was credited with a potential daily production of 74,081 barrels, but this is an artificial figure just as the accredited potential production figures of Winkler County and the Yates fields are considered far out of proportion to actual producing quantities.

Owners of producing wells in the Roberts-Settles deep pay area initiated a Sunday shut down plan on drilling and producing operations late in March, and the plan has been obeyed 100 per cent. since the first Sunday in April. The adoption of the 24-hour holiday over Sunday is the first time that such has been introduced in Texas, where a large number of separate lease owners are involved, and it was planned for the benefit of the field men as well as to restrict production.

The following table shows the crude recovery from the deep pays during the first seven and one-half months of proration enforcement; that produced during April, and total to May 1 by companies:

Company	Total Runs First 7½ Mos.	No. Wells	April Prod.	Total Prod.
Amerada Petroleum Corporation	380,282	7	76,873	457,155
American Maracaibo Company	362,773	7	105,508	468,281
The California Company	31,876	1	21,427	53,303
Cosden & Company	254,690	6	21,334	276,024
Coyle-Concord Company	123,611	1	10,234	133,845
Cranfill & Reynolds, Inc.		1	3,871	3,871
Group No. 1 and Marland Production Company	240,501	9	84,535	325,036
Howard County Oil Corporation....	34,256	1	28,609	62,865
Humble Oil & Refining Company....		1	697	697
Louisiana Oil Refining Corporation..	134,896	2	40,304	175,200
Magnolia Petroleum Company	869,612	15	76,302	965,914
Marland Production Company	47,706	2	4,711	52,417
Merrick & Bristow Company.....	333,603	4	74,859	408,462
Moody Corporation (Superior)	830,650	19	140,195	970,845
Owen-Sloan and Cosden & Company.	699,749	7	114,471	814,220
Plymouth Oil Company	42,047	1	22,403	64,450
Schermerhorn Oil Company	649,026	8	78,093	727,119
Shell Petroleum Corporation	10,700	1	17,537	28,237
Sprague Oil Company	149,474	3	19,398	168,872
Sun Oil Company	428,449	6	78,547	506,996
Taylor-Link Oil Company	28,254	2	8,137	36,391
Ward Oil Company	65,426	3	34,924	100,350
Witherspoon & Glasscock Company..	18,205	2	19,570	37,775
TOTAL	5,735,792	111	1,082,539	6,818,331

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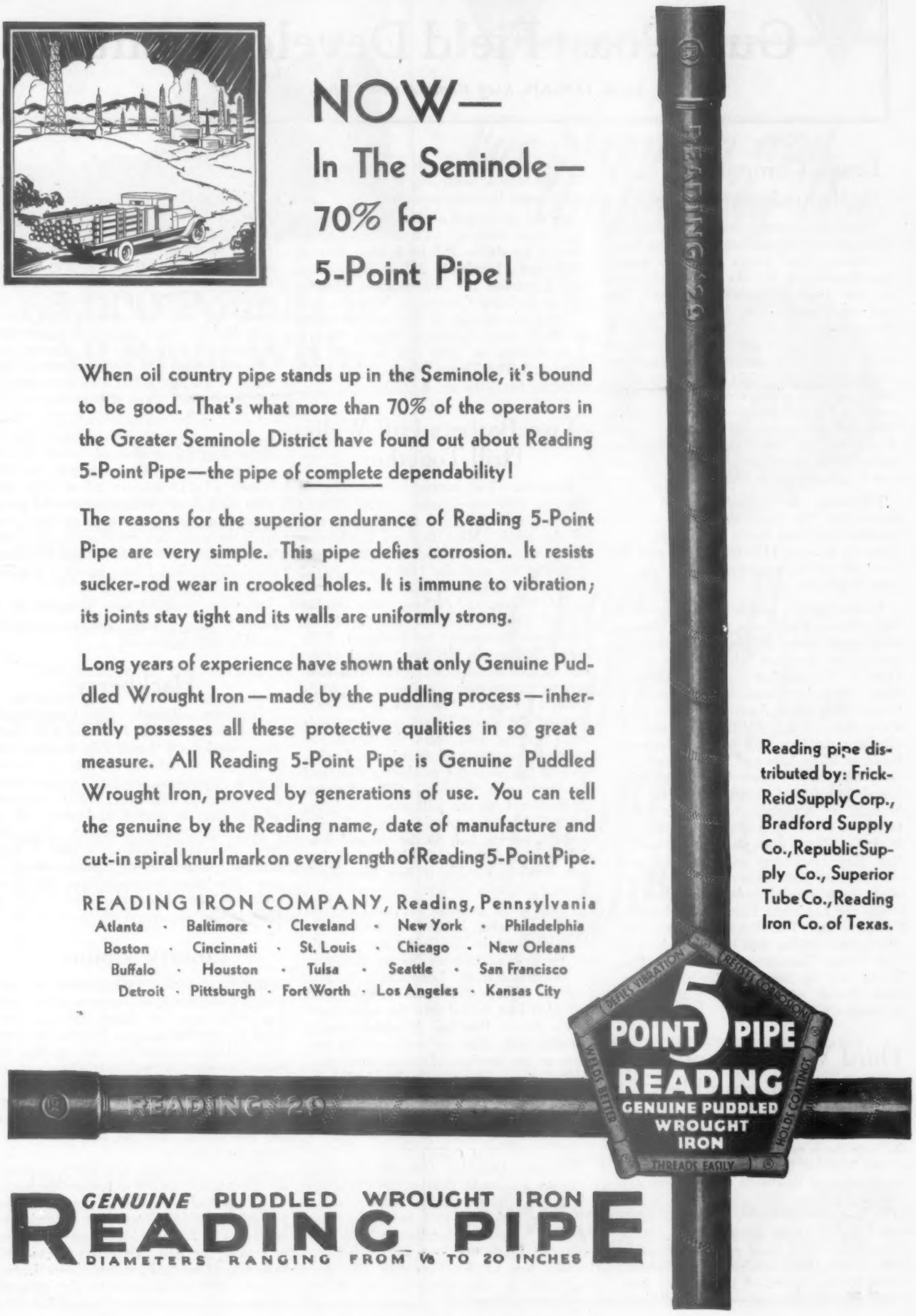

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Gulf Coast Field Developments

JACK LOGAN, *Staff Representative, Houston, Texas*

Texas Company Proves Louisiana Dome

Houston.—Another known salt dome has been added to the already long list in South Louisiana; The Texas Company having encountered salt in Lake Barre A-1, a test in Lake Barre, Terrebonne Parish. The test went into salt at 850 feet, and has been abandoned in salt at 920 feet. It is located 2500 feet south and 1250 feet west of the northwest corner of Section 30-21s-20e in Section 37-21s-19e. This dome was originally discovered by the Louisiana Land & Exploration Company, using seismic instruments, and is one of the 10 domes which The Texas Company acquired from Louisiana Land & Exploration Company late in 1928.

Following the abandoning of Lake Barre A-1, The Texas Company has made location for Lake Barre A-2 on the same dome at a point 1370 feet south and 560 feet east of the northwest corner of Section 30-21s-20e.

Outside of this test in Lake Barre proving a dome, The Texas Company has not done much actual drilling on the areas involved in the deal with the Louisiana Land & Exploration Company, although some work has been done on each of them. The first locations were made about the opening of 1929. In practically all cases the locations are on submerged lands, in lakes, bays and bayous; and derricks and boilers must be put on piling foundations, and materials must be brought in by boat; resulting in slow progress. With the exception of this test in Lake Barre and tests at Vermilion Bay, East Hackberry and the south part of Calcasieu Lake, where domes had already been proved before the deal between the Louisiana Land & Exploration Company and The Texas Company, the only actual drilling that has been done by The Texas Company has been on Dog Bayou A-1 in Section 6-22s-16e, Terrebonne Parish, which is drilling at 885 feet in sandy shale.

Third Well in New Deep Sand at Humble

Houston. — The Texas Company's Stevenson 39, third large producer from the new deep sand in the southeast part of the Humble field, flowed 3190 barrels on Monday of this week, the twelfth day after completion. Cullen and West's two wells that are producing from the same sand, Morris 1 and Morris 3, now have a combined daily yield of approximately 4000 barrels. Other production at Humble, added to the output of these three deep wells, gave the field an average daily production of 11,700 barrels during the week ending May 4, according to the American Petroleum Institute estimate.

In the deep sand area there are several tests now drilling. The Texas Company's Landslide 262 is drilling lime at 2269 feet; Landslide 263 is rigging up, and Landslide 264 is a location. Humble Oil & Refining Company's Williams 1 is waiting on cement to set around casing at 3938 feet; Cullen & West's Morris 4 is drilling at 3160 feet in sand and lime, and The Texas Company has made location for Wheeler & Pickens 1.

Two Barbers Hill Wells Drill Together

Houston.—Two companies operating at Barbers Hill experienced trouble May 3 when one drilled into a producing well of the other. Mills Bennett Production Company's Smith 2 had been completed earlier in the week for 1400 barrels initial production, making pipe line oil from sand at 5147-97 feet, and on May 3 was making around 1000 barrels. On that day Rexal Petroleum Company (Joe Bashara), drilling at 3908 feet in McLean 1, which at the surface is 60 feet distant, hit the Mills Bennett well; puncturing casing of the Mills Bennett producer and sticking the drill stem of the Rexal Petroleum Company's test. Drilling mud from the Rexal Petroleum Company well then began flowing up with the oil in the producing well, and the latter quit flowing. Mills Bennett Production Company will attempt to bring its well back by running 4½-inch pipe down below the hole in the six and five-eighths casing through which the oil has been flowing, making it flow henceforth through the smaller pipe.

While it is unusual for one well to drill into another, it has been done in various instances in the Gulf Coast, including one recent case at Bayou Bouillon, St. Martin Parish, Louisiana. In that field the Rycade Oil Corporation's State 3 at 3350 feet drilled into the same company's Bayou Bouillon 4, which was a pumping well. The two wells are 300 feet apart at the surface. Drilling mud constituted the evidence of what had happened. Bayou Bouillon 4 has been temporarily plugged while work is progressing on State 3.

Houston.—Humble Oil & Refining Company has made location for F. Pucek 1 in the L. Thurner survey, Falls County, after abandoning Piper 1 in that area at 1638 feet. The new location is 3917 feet from the south line and 217 feet from the east line of the F. Pucek 172 acre tract, and is approximately five miles northwest of Rosebud.

South Liberty

Houston. — In the north end of the South Liberty field, Liberty County, The Texas Company has an interesting well in Green 5, which blew in on the night of May 3, making 1000 barrels daily with the drill stem still in the hole. Production comes from 3193 feet. Monday of this week the well was making 860 barrels pipe line oil daily on a five-eighths-inch choke. The oil tests 40.2 degrees corrected gravity. The well had tested fresh water and a little oil at 3174 feet, and was being deepened when it blew in.

Green 5 is northeast of The Texas Company's Green 1, which opened the extreme north extension of South Liberty on February 26, 1928, coming in for 1700 barrels of 24.8 gravity oil at 2290 feet. That well is still producing on the pump. In addition to the two wells on the Green land, there are two other producing wells in this part of the field, Vacuum Oil Company's River Bed (State lease) 1 and The Texas Company's Pickett 2.

The new well, Green 5, however, is from a deeper sand and is producing considerably lighter oil.

Hackberry

Houston.—Rycade Oil Corporation and Humble Oil & Refining Company completed Gulf Land 2 in Section 30-12s-10w, Hackberry field, Cameron Parish, Louisiana for 600 barrels initial production at 3965 feet; but the amount of oil has decreased and the well is making much gas; a report early this week showing it making 80 barrels pipe line oil, together with large flow of gas. The same interests have abandoned Gulf Land 1 on the same lease at 4333 feet.

Liberty County

Houston.—Union Exploration Company's Esperson 2, second test of an area five miles west of South Liberty, outlined by torsion balance, is being washed down in preparation for an attempt to resent screen. The well sanded up a short time ago when a test was made in a sand at 5797 feet. After the screen was set, the well was swabbed and it began blowing gas and a little oil, but soon afterward sanded.

This well, Esperson 2, is 3100 feet north of Esperson 1, the first test of the area. That test had showings of gas, but was abandoned at 5800 feet. The second test is said to be 250 feet higher on the structure than the first. Esperson 2 has had showings of oil and gas at various depths —from 3200 feet down to the present depth.

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Salt Flat Ranks First in South and Southwest Texas

Luling, Texas.—The Salt Flat field, located in Caldwell County and near Luling, became the largest source of crude production in the Gulf Coast and Southwest Texas during April through having produced 1,225,575 barrels of 35-36 gravity crude. This field reached a new peak during April, with an average daily output of 40,853 barrels, or 7,211 barrels increase over the daily average maintained in March, and has produced a total of 3,709,256 barrels since the discovery of shallow production in June, 1928, to the close of April. The bulk of this production is coming from the Edwards lime, which was discovered by the Sun Oil Company last October.

Intensive drilling campaigns being waged by lease owners in the northern part of the field on practically proven flush production acreage indicates that the peak on production will not be reached until late in May, or possibly in June.

Salt Flat crude is proving very popular with major and independent purchasing agencies, although more than three-quarter million barrels of the April production was transported to distant refining centers and Coastal points in tank cars. A flat price of $1.00 per barrel at the well is being paid by all crude buyers, all having followed the lead taken early in April by Sun Oil Company, which boosted the price 20 cents per barrel in an effort to attract more connections.

Gulf Pipe Line Company is the largest shipper in tank cars, having handled 352,717 barrels during April, and all of same was produced by the Gulf Production Company. Humble Oil & Refining Company leads the field in production, having produced 389,382 barrels during April. Humble Pipe Line Company handled all of this oil by tank car shipments and local storage. The latter company is completing a 120 mile eight-inch line from its G. R. Tiller tank farm, located near the field, where five 80,000 barrel steel tanks have been erected, to connect with its Gulf Coast system at West Columbia. Shell Pipe Line Company handled 327,366 barrels of crude during April for the Shell Petroleum Corporation, having dispatched this oil via its six-inch line, extending from the field to a point near Austin, where connection is made with the recently completed McCamey-Houston 10-inch trunk line. Although Magnolia Pipe Line Company has a direct connection with the field, its traffic is confined to common carrier service rendered for the Atlantic Oil Producing Company and The Texas Company.

The Petroleum Pipe Line Company of Texas and Sun Oil Company are running and purchasing all the oil produced by independent operators in the field, and during April the latter handled 79,207 barrels in tank cars from Luling rack to its Gulf Coast export terminal at Sun Station.

The Petroleum Pipe Line Company handled 62,342 barrels during April, as compared to 46,887 barrels during the month previous. This company is handling all oil produced by Cranfill & Reynolds, Inc., and a portion of that held by Nash-Windfohr & Perry, and is at work on increasing the size of its rack from 10 to 30 cars capacity.

LULING DISTRICT—SALT FLAT POOL
Pipe Line Runs—April 1929

Company	Lease	Bbls.	Total
Petroleum Pipe Line Company—			
Cranfill & Reynolds	Smith	30,589	
	Jackson	1,162	
	Northcutt—A	6,627	
	Northcutt—B	9,395	
	Hanson	9,438	
Nash-Windfohr & Perry—	Davis—A	361	
	Davis—B	None	
	Wilson	4,767	62,342
Magnolia Pipe Line Co.—			
The Texas Company.	Merriweather	10,760	
	Moses	None	
	New	861	
Atlantic Oil Production Company	Davis	2,994	14,561
Gulf Pipe Line Company—			
Gulf Production Co.	O. Connelly	72,988	
	R. W. Carter	64,870	
	J. J. Davis	13,862	
	W. L. Smith	35,510	
	Jim Smith	1,701	
	Allen & Tiller	16,776	
	M. Tiller	62,468	
	J. D. Wright—A	84,542	352,717
Sun Oil Company—			
Sun Oil Company—	Cora Malone	18,085	
Abercombe & Harrison	E. I. Moses	22,031	
M. K. Townes	Hickman	14,168	
Golden West Oil Company	J. Wilson	9,932	
	Cora Malone	2,087	
Nash-Windfohr & Perry	J. Wilson	4,813	
	Davis "A"	721	
	Davis "B'	None	
Turman & Brown	Jackson	3,467	
Carl Brothers Et Al	Cora Malone	2,104	
The Victor Co.	Walker	720	
	Golding	203	
Forest Oil Company	Fleming	876	79,207
Shell Pipe Line Company—			
Shell Petroleum Corporation	R. W. Carter	10,331	
	R. W. Malone	26,400	
	Wm. Moses	40,167	
	Jim Smith	2,736	
	W. L. Smith	3,650	
	Floyd Tiller	161,596	
	G. W. New	17,925	327,366
Humble Pipe Line Company—			
Humble Oil & Refining Company	W. O. Allen	20,604	
	J. J. Davis No. 1	1,981	
	J. J. Davis No. 2.	8,063	
	W. F. Davis	2,961	
	M. Briscoe	20,449	
	Floy Gray	19,131	
	L. G. Hanson	14,270	
	Moses & Baggett—A	76,254	
	Moses & Baggett—B	102,063	
	Johnson—A	22,466	
	Johnson—B	11,815	
	J. B. Tiller	19,636	
	J. R. Tiller—A	27,473	
	J. R. Tiller—C	2,487	
	Wm. Smith	21,117	
	J. D. Wright	10,803	
	T. A. Tiller	1,580	389,382
Total Pipe Line Runs			1,225,575
Daily Average Runs			40,853

Louisiana-Arkansas Field Notes

Pine Island Production Extended Three Miles

SHREVEPORT.—With Champagnolle marking time and Mount Holly apparently having added another failure, major interest during the last week in this territory was centered in the D. C. R. Oil Company's Hunter Estate 1 in NW NW of Section 17-19-14, Caddo Parish, which was completed during the week in 12 feet of sand flowing 130 barrels of 42.8 gravity oil by heads, from total depth of 2422 feet.

The Hunter Estate well extends the Pine Island field three miles southeast and is in reality approximately four miles southeast of any production of consequence.

The territory around the extension well, however, is regarded as extremely treacherous and the behavior of the well since its completion has been far from satisfactory. Standard Oil Company of Louisiana, between the time of a drill stem test and the bailing in of the well, acquired it and approximately 1100 acres immediately adjacent for $10,000 cash and a working agreement of 60-40 in production.

After the well production dropped from 305 barrels, its initial production, to 130 barrels Friday, preparations were made to set two-inch tubing with packer on top of the liner.

After flowing at its top peak for approximately 14 hours following bailing in, 22 feet of shale was cleaned out of the bottom of the hole, but the production continued downward, the yield for the succeeding 24-hour period being 240 barrels, and for the next 24 hours, 130 barrels.

Standard Oil Company of Louisiana has already made an offset 900 feet to the northwest, to be known as Carter 1, in Section 7-19-14. It is probable that Gulf Refining Company will also drill an offset to the west, Oden 1, in NE NE of Section 18-19-14.

The nearest production to the new producer is Arkansas Natural Gas Corporation's Ballard Island Oil & Gas Company 2, drilled to 2310 feet, which had an initial production of 30 barrels. This well is in NE NE Section 35-20-15, three miles directly northwest of the Hunter well. However, the Ballard well was completed in June, 1913. A well drilled nearer but which did not produce, was Arkansas Natural Gas Company's Glassell 3 which was 400 feet south and 225 feet east of NE corner of Section 36-20-15. Depth of this hole was 2321 feet.

One mile due south of the D. C. R. Company's well the Caddo Louisiana Oil and Gas Association in 1919 completed Dillon Lumber Company 1 in NW NW of Section 20-19-14 at 2450 feet. This well pumped about five barrels of oil for a year. A half mile southeast of this latter test and in the same section with it, the same company also obtained another five-barrel pumper in the same year. Six-inch casing was set at 2350 feet, total depth of the hole being 2600 feet.

In March, 1925, Woodley and Collins drilled a test in Section 23-19-14 to 2675 feet without obtaining production. This is about three miles south and east of the Hunter Estate well. In June, 1923, W. E. Perkins hit salt water in McFarland Vann A-1 in Section 18-19-13, five miles east of the new producer, at 2603 feet. Several years ago O. G. Collins and associates drilled to 2609 feet without getting production in another test in NE NE Section 23-19-14 and a similar fate met another well in Section 27-19-14, two miles southeast of the Hunter Estate well.

With these failures on record in so many directions from the new producer, many oil men are skeptical of whether a new field of any great proportions will be opened as a result of this well.

Mount Holly Failure

The new Mount Holly district of Ouachita County, Arkansas, where two wells are now producing, during the week seems to have added another failure, the second of the new district. This is Charles McDonald's Wilson B-2 in Section 25-15-18, a northern offset of 300 feet to the discovery well, located in the same section. McDonald on Saturday was reported mudding up the hole to abandon at 2906 feet, 40 feet below the level from which the discovery well is producing. McDonald had tested 15 fourbles of salt water and salty drill mud with a light show of oil in a drill stem test from 2846 to 2857 feet. Just above this he had run into a red shale formation. When the well was deepened after the drill stem test, no satisfactory formation was found for a test.

Root Refineries in Wilson 1 in the same section and a direct eastern offset to the discovery well at a distance of 500 feet, decided to plug back to 2845 feet where the well swabbed 142 barrels of oil. Casing has been set at this depth and is being allowed to harden. After swabbing oil at 2845 feet, the well was cored ahead and a broken sand formation was encountered from 2863 to 2869 feet, which showed some oil and a blue shale, but it was decided the higher horizon looked more promising so the hole was plugged back to that level.

Magnolia Petroleum Company in C. M. & K. Wilson 1, in the same section, is not getting satisfactory results. Operators are repairing rig with the hole in red beds at 2917 feet, after a dry drill stem test from 2866 to 2873 feet, in three feet of sand. The well had had a similar experience in a drill stem test from 2852 to 2859 feet.

Cumberland Petroleum Company's Burton 1 in Section 24-15-18, a half mile north, will be the next test in the new area. It is drilling hard rock at 2775 feet. Arkansas Drilling Company has taken over L. L. McDonald and associates' Crowley 1 in Section 27-15-18, and is rigging up to start drilling within a few days.

Flaucher and associates' Bucks 1 in Section 7-15-17, two and a half miles northeast of the discovery well is still shut down at 2475 feet and George Kouri has made no further development of his location for Henson 1 in Section 24-15-18. Six miles north of the discovery well Timberlake and associates are drilling at 2170 feet in Wright 1, in Section 25-14-18.

Champagnolle

Champagnolle's southeastern extension wells, that have been "on again, off again" since being completed as gushers making a large amount of salt water, remained status quo during the week. Ohio Oil Company's W. N. Raulston 1 in Section 12-17-14, that started a flurry of drilling in the southeast portion of the Champagnolle area, after that part had previously been condemned, resulting in three extensions, continues to maintain its yield. On Friday this well made 1280 barrels of net oil along with about the same amount of salt water. The same company's B. H. Raulston 1, in SE of SE of the same section and a quarter of a mile south of the W. N. Raulston 1, will be pumped

News From Rocky Mountain Fields

under pressure from total depth of 3017 feet. It was originally completed making a net daily oil yield of 1230 barrels, with a similar amount of salt water through a 1½-inch choke, but later rapidly fell away to 63 barrels daily. Ohio Oil Company's Sam Oliver 1, SW SW Section 7-17-13, a quarter of a mile east of the B. H. Raulston and a like distance southeast of the W. N. Raulston 1, which has also gone dead and been revived and is now dead again, after flowing about 1200 barrels of net oil daily through a small choke, is having 6⅝-inch casing recemented.

Chief interest in Champagnolle at present, aside from the southeast extension territory, is centered in Lion Oil Refining Company's Stowe 1, Section 4-17-14, a mile north and west of production. A number of failures have been drilled before in this section.

The Stowe well tested dry in a drill stem test from 2997 to 3097 feet, but a core from 3097 to 3101 feet showed a sand that showed some oil.

Considerable interest is being shown in Sundby and associates wildcat well, Yocum 1 in Section 29-16-17, Union County, Arkansas. This well is now drilling at 3310 feet after testing salt water in a drill stem test from 2721 to 2729 feet. Red beds were topped at 2960 feet.

Other Arkansas wildcats include: Louisiana Oil Refining Corporation's Manley 1 in Section 15-15-19, Union County, several miles east of production in Stephens, which is drilling at 4112 feet; Hawthorne Oil & Gas Company's Smith 1 in Section 8-16-17, Union County, drilling at 3002 feet; J. W. Olvey's Cottrell 1 in Section 22-19-17, Union County; Helena Oil & Gas Company's Pickler 1 in Section 19-19-22, Columbia County, drilling at 2510 feet; Atlantic Oil Producing Company's Bledsoe 1 in Section 20-15-7, Ashley County, drilling sand rock at 2760 feet; Ohio Oil Company's Jerome Lumber Company 1, Section 13-15-4, Drew County, drilling at 3447 feet after topping the Nacatosh at 3152 feet; Ohio Oil Company's Southern Lumber Company 1, Section 19-16-9, Bradley County, coring at 3257 feet.

In Tensas Parish, Louisiana, a rank wildcat territory, Enochs and associates after being shut down for months in Curry 1 in Section 39-11-12e, at 3583 feet, have plugged back to 3522 feet to shut off a flow of salt water. V. E. Shaw and associates are arranging to deepen Voss 1 in Section 1-20-3w, Lincoln Parish, after testing dry through drill stem, at 2732 feet. Robeline Oil & Gas Company is shut down repairing rig in Cassady 1, a wildcat in Section 7-8-9w, Natchitoches Parish, after testing dry with a show of gas at 3086 feet.

Hudson Bay Company Buys Northern Wells

Calgary, Alta.—Imperial Oil Company is reported to have sold the production of two of its wells in the Arctic Circle, Northern Canada, to the Hudson's Bay Company, which plans to build a small skimming plant there. It will use the gasoline for motor fuel, the kerosene for lighting purposes, and the residue for fuel. Imperial Oil Company drilled five wells at Fort Norman, just inside the circle, two of which are good producers, while three were drilled off structure.

35 to 50 Wells Planned For Bannatyne

Great Falls, Mont.—Operators interested in development in the Bannatyne field, 45 miles northwest of Great Falls, were somewhat excited last week by the discovery in the Producers Independent Oil Company's (Archer & Cudahy interests of Chicago) well which developed oil production in a broken line at 1581-96 feet, about 15 feet below the base of the Emerick sand, which at present is the producing horizon in the field. The well produces 10 barrels per day in the Emerick and with the new production just encountered will be good in all for about 30 barrels. It is said that this summer will see 35 to 50 wells drilled in Bannatyne. Plans for a pipe line outlet, to be laid by the Hardrock Oil Company are going forward with satisfactory speed.

Sweetgrass Hills

Great Falls, Mont. — An interesting showing of oil was reported by the Sunburst Oil & Refining Company and the Bear's Den Oil Company in their joint test in the Sweetgrass Hills area, just south of the Canadian boundary. This test is located between a large gas well developed by the Sunburst interest last year and a well which had water in many sands and also several good showings and which was abandoned because it was not commercial. For this reason, it is believed that the present joint test has a fine chance to discover oil.

Pondera Extension Well Starts Flowing

Great Falls, Mont.—Warren Oil Company's completion in the Pondera field which was estimated as a moderate pumper when it was completed two weeks ago, started suddenly to flow naturally at the rate of about 180 barrels per day. This has established not only an extension to the west of this newest field in the state, but has proved the fact that this area may be more prolific than the main producing area as it is known today. Midwest Refining Company has located an offset to the north of the discovery. There were two small completions in the field, for the last week. One belongs to Ohio Oil Company and one to Fulton Petroleum Corporation.

Howard Structure

Newcastle, Wyo. — Wyoming Drilling Syndicate found 2000 feet of light green oil in its well on Howard structure, Eastern Wyoming, when it attempted to pull out a string of casing, preparatory to sidetracking a crumpled string. The well has been standing at 4350 feet since last December. The oil is evidently coming from the bottom of the hole, believed to be not more than 100 feet from the second Wall Creek. A new 120-foot derrick is up, and the well will be completed with rotary. The structure is supposedly closed, and is the first to be tested along the west slope of the Black Hills. It was approved both by H. Norman Snively and Charles T. Lupton.

Idaho Wildcats Resume

Idaho Falls, Idaho.—Three wildcat wells being drilled by independent operators in this state have resumed operations. Norton Brothers Oil & Gas Company drilled to 2200 feet and encountered water which is flowing over the top of the casing, and which is reported to be showing considerable oil. This well is on Arimo structure, about 75 miles south of this city. North of Idaho Falls, about 40 miles, on Horseshoe structure, the Grand Teton Oil Company and the Standard Exploration Company have spudded in their joint test. Gas Dome Oil Company of Boise, Idaho, will drill a structure near Hammett this spring, according to an announcement made by the president of the company.

San Simon Valley

Bowie, Ariz.—The old San Simon Valley well, which was started some years ago by S. W. Funk and associates, of California, is to be drilled to completion by the Coast Line Oil Company, also of California. This well has been standing for some time at 1500 feet and is to be drilled to 4000 feet if necessary, according to the new contract.

South Dakota Test

Hot Springs, S. D.—W. L. Dillon and associates have all material on location on the Dillon structure, near here, for their wildcat well which is to be drilled immediately. The structure is west of Provo, South Dakota.

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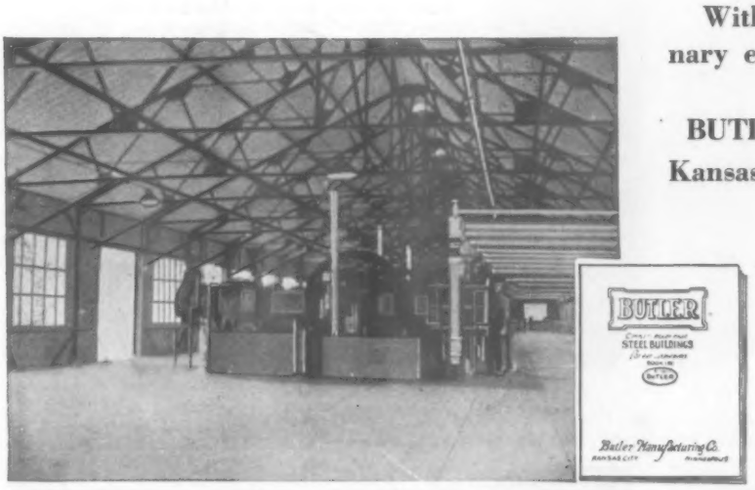

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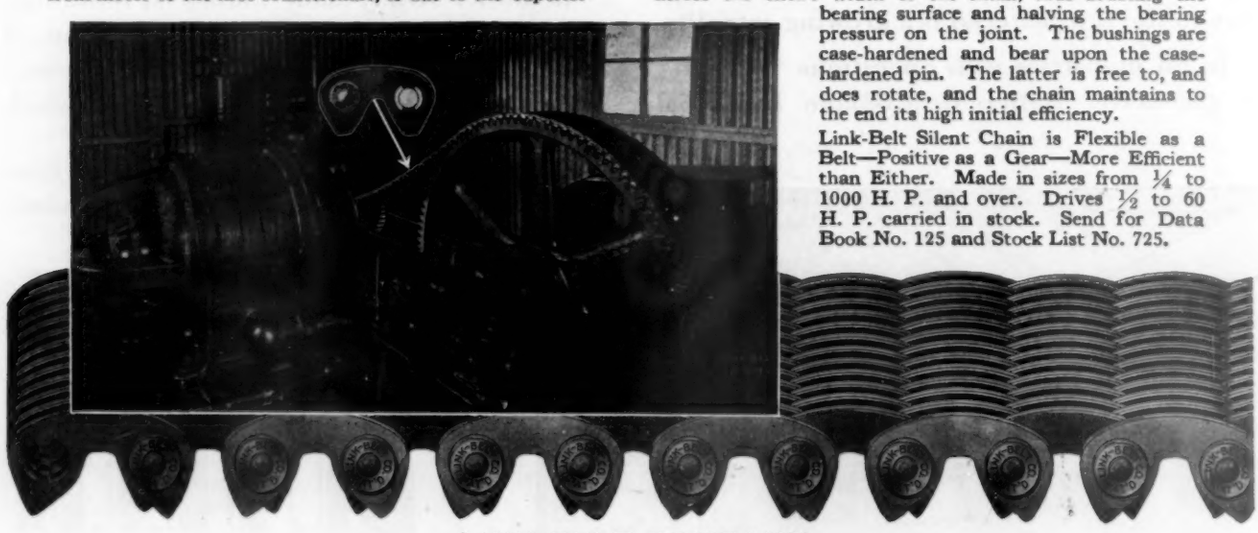

Link-Belt Silent Chain is Flexible as a Belt—Positive as a Gear—More Efficient than Either. Made in sizes from ¼ to 1000 H. P. and over. Drives ½ to 60 H. P. carried in stock. Send for Data Book No. 125 and Stock List No. 725.

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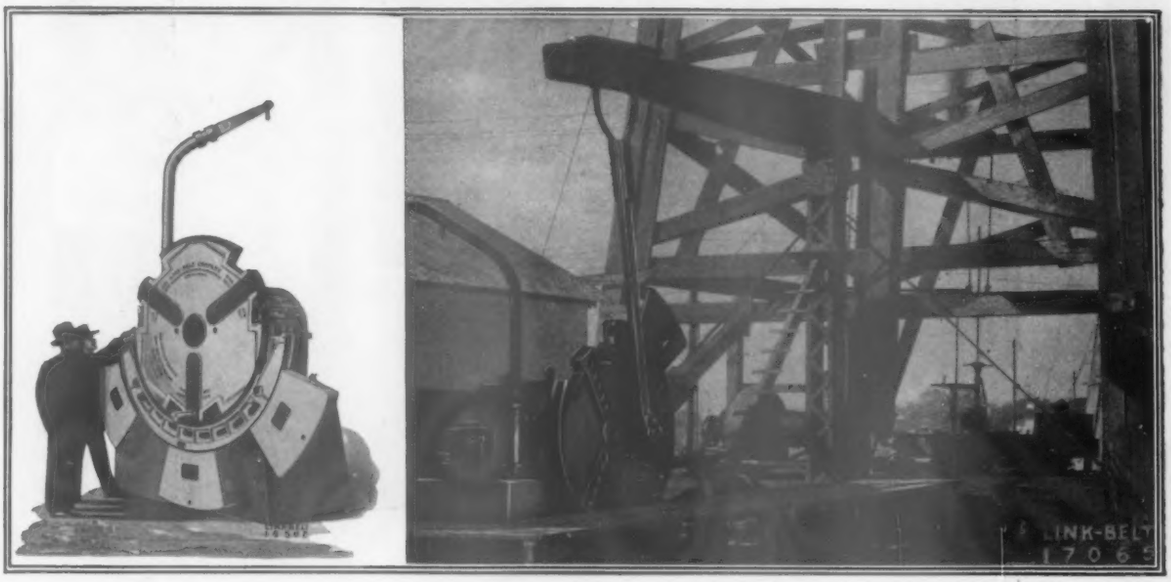
for the Oil Industry

RUF-NEK Pumping Unit



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A counterweight mechanism is provided that permits adjustment of the counterweights, so as to produce any desired counter-balancing effect. It is thus possible to balance the pumping load accurately for any and all conditions.

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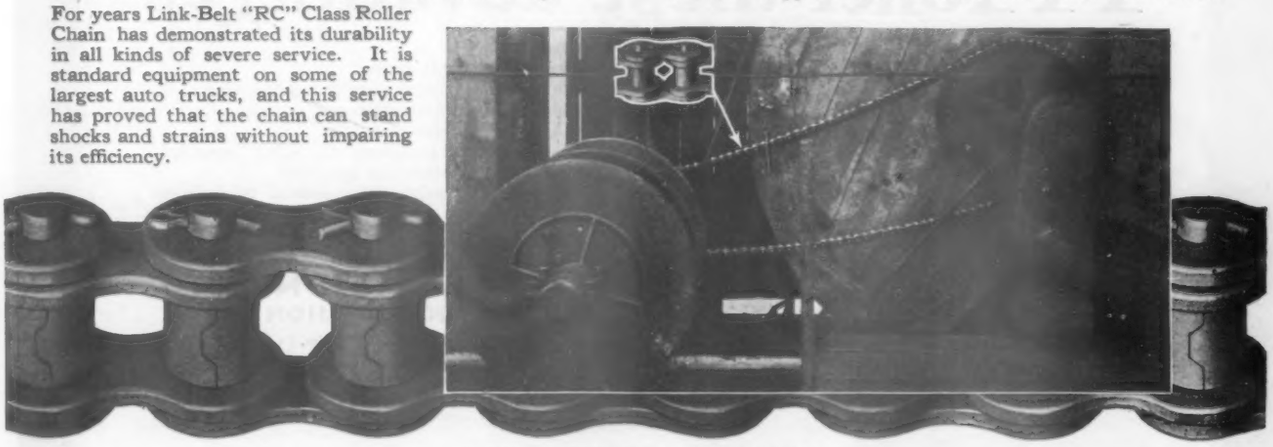
Send for a copy of Link-Belt Roller Chain Data Book No. 257.



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BYRON JACKSON

Much Drilling *and* More Leasing In New Asher Pool

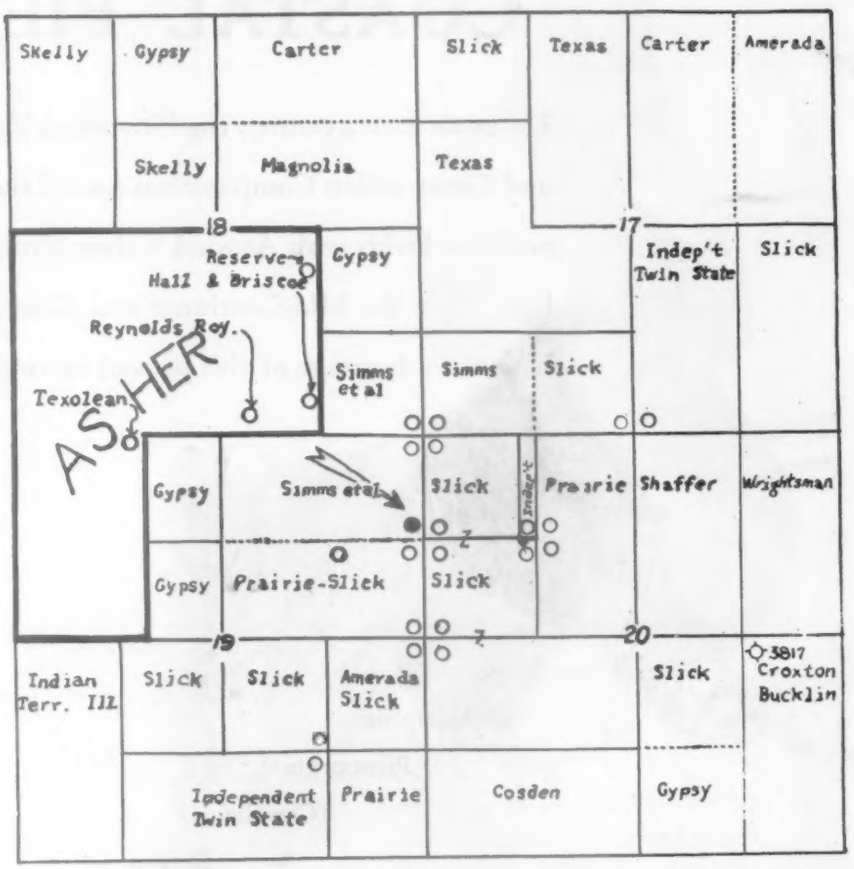
By WARREN BAKER
Staff Representative

THE latest "hot" spot in Oklahoma is the new Asher pool in southwestern Pottawatomie County. Twenty-four locations have been made in the vicinity and at least half a dozen more are to be made at once. Four of these new tests are on the townsite of Asher, and it is probable that additional tests will be staked there at once. These call for a number of offsets outside the city limits and which have not been made at this writing.

The discovery producer in the meantime continues its fine performance. It is averaging slightly better than 3100 barrels per day. The well has not been deepened and is producing from 3640-3699 feet. This is called the Viola lime, however, opinion differs as to whether the bottom of the hole is still in the lime or in the Simpson sand. At any rate the last part of the hole yielded a big increase in production.

The test in itself is a very important one and made doubly so by its production record. It is situated on the Arbuckle uplift. The formations on the uplift are found much higher than slightly north. The uplift area has not been seriously regarded as highly productive. A number of important showings and developments during the past year has served to materially reduce the unfavorable impression, but none of the strikes were in the small class with the Simms producer.

Simms Petroleum Company et al's Laster 1, SEc NE NE Section 19-6n-4e, discovery well, has produced approximately 70,000 barrels since it was drilled in on April 12th. The belief that it has entered the Simpson formation is strengthened by its steady flow as past history of Viola lime wells has been that they soon show sharp drops in their recovery.



Map of the new Asher pool in Southwestern Pottawatomie County, Oklahoma, showing the new locations

Many Lease Trades

As a result of the well's big flow and the fact that a number of concerns were not sitting in on the play, there have been a large number of acreage deals. The purchases of T. B. Slick stand out. He has spent approximately $2,000,000 in gathering together a large amount of very promising acreage. Slick's largest deal was the purchase from C. J. Wrightsman of 350 acres of leases and 40 acreage of royalty in the district. The consideration is said to have been $1,200,000, part in cash and part in oil. Included in the transaction were SW NW Section 20-6-4e, the southeast diagonal offsetting 40 acres, and the N½ SW Section 20-6-4e. He also got an interest in some acreage with Simms Petroleum Company to the north of the well.

The south offset to the producer owned by Prairie Oil & Gas Company is now held jointly by Slick and Prairie. This piece is 80 acres. The details of a deal between Amerada Petroleum Corporation and T. B. Slick are not known, but Slick has secured the west 40 acres of the Amerada 80 covering N½ SE Section 19-6-4e and a half interest in the other 40, according to reports.

When the well was first drilled in, Slick purchased the east offset 40 acres from the Mardor Oil Company (Croxton & Bucklin). In addition he got from the same people the SE SW Section 17-6-4e, one-half mile northeast of the producing well.

Independent Oil & Gas Company is another active buyer in the district. It has taken a half interest in two 80-acre tracts from the Twin State Oil Company. The deal is said to have called for $120,000 cash and two free wells to Twin State Oil Company. One 80 is the W½ SE Section 17-6-4e and the other is the SE SW and SW SE Section 19-6-4e. Independent Oil & Gas Company also bought a 10-acre piece from Mardor. It is the E½ E½ NW NW Section 20-6-4e.

Royalty deals have been much more numerous than the lease transactions. These transactions have been made so rapidly that it has been hard to keep up with them. Every lease in the immediate vicinity of the producer has a very large

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number of royalty owners. Prices as the result of competitive bidding and the well's action has jumped skyward.

Shallower Depth Attractive

The shallower depth of the new well in comparison with the producing sands found immediately north in the St. Louis and other Greater Seminole producing fields is attractive to most of the operators. The average well in the Asher district will probably be completed for around $50,000. At this rate the discovery well has easily paid for itself.

The shallower pay horizon also means that the field will experience quicker development than if it were lower. The first of the present drilling wells will probably be completed during the last half of June.

In the meantime Oklahoma operators will watch the discovery producer's performance and check the logs from the various tests. If the drilling wells prove the Asher field to be a prolific one an intensified development play along the Canadian River to the Allen field, nearly 40 miles to the east and slightly south, will result. Some favor the play to the north and northeast toward the Seminole fields. In addition the well adds favor to the play extending westward along the Canadian river, toward the Tidal-Simms-Twin State-Gardner test in northeastern McClain County. The revision of the belief regarding the Arbuckle uplift territory can practically be completed by the Simms Petroleum Company and the Tidal-Simms-Twin State-Gardner wells. The latter is more than 15 miles to the southwest of the Simms Petroleum Company producer.

Marketing Outlets

The new field, should it develop into a big producing area, will have little difficulty securing an outlet for the oil. It is near several transcontinental lines in addition to being near the St. Louis field from where branches could be extended.

Consolidated Pipe Line Company has a two-inch line running to the producing well from the Pearson field. Prairie Pipe Line Company is bidding for production connections in the new area and has announced plans for laying a line to the field.

Some Pipe Line and Transmission Problems

(*Continued from page 29*)

solute value of the gage pressure of these tables.

Most pressure extension tables are based upon a zero gage pressure corresponding to 14.4 pounds absolute and if the atmospheric pressure is not 14.4 or is not assumed to be 14.4 pounds, these tables are not suitable unless there is a clause which specifically states that the zero of gage pressure is to be assumed a 14.4 pounds per square inch absolute.

Definition of Unit Measurement

An expression similar to the following may be used to define the unit of measurement and the methods of computation: The amount of gas shall be computed in cubic feet at a base pressure of —— pounds per square inch absolute according to Boyle's Law, and at a temperature of 60 degrees F. The average barometric pressure used in calculating pressure multipliers or pressure extensions shall be —— pounds per square inch absolute, regardless of the actual barometric conditions.

Practically all of the gas transmitted through natural gas lines is measured by orifice meters. The orifice meter has been acknowledged as a standard method of measurement for large volumes. Although this principle has been extensively used, some believe that it is not as accurate as other types of measurement and that it is a new method of measurement.

The Standard History of the World, Volume 1, 1928, pages 139 and 140, contains the following paragraph:

"They (the Chaldeans) measured distances in the heavens by taking the width of the sun's disc as a unit. By comparing the quantity of water discharged through an orifice in a jar in the time occupied by the sun crossing the horizon on the morning of the equinox with the amount discharged through the same orifice at the next sunrise, they discovered that the amount discharged between the two risings of the sun was seven hundred and twenty times the amount discharged during sunrise on the equinoctial morning. They thus inferred that the sun's orbit measured seven hundred and twenty times his disc, and from this they derived a unit to measure space and time."

"The Chaldeans discovered and recorded the fact that each cycle of the moon's eclipses is completed in a period of two hundred and twenty-three months, and from this discovery they computed the length of the synodic and periodic months so accurately that modern astronomers have found the calculation to fall short of less than five seconds of our time. They carefully recorded all the results of their observations. The Greek Callisthenes, who had accompanied the expedition to Alexander the Great, sent to Aristotle from Babylon a series of tablets on which were inscriptions recording astronomical observations dating as far back as 1903 years before the year 331 B. C., the year that Alexander entered that city. These observations would therefore reach back 2234 years before Christ."

This quotation indicates that the orifice principle is as accurate as time and has the authority of age.

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Stocks in All Principal Fields

Say you saw it in The OIL WEEKLY

Rotary Fishing and Fishing Tools

(*Continued from page 32*)

though there may be leakage, sufficient pressure may pass downward through the bit and up the hole to agitate sand or cuttings and assist in loosening the frozen pipe so that it may be pulled easily, especially when the drilling pump is large, and its speed can be raised high.

When circulation cannot be established through frozen pipe with a single pump, the two pumps in tandem may elevate the pressure sufficiently to circulate, but if not, then the high pressure generated, passing down and out through the bit, is exerted upward on the frozen pipe, assisting in lifting the same. For instance, with a 6-inch drill collar, which is 7.75 inches in diameter, the area subjected to upward pressure is 47.17 square inches, and with pressure of 1000 pounds, an upward push of 47,170 pounds is exerted to push the pipe upward, in addition to the pull from the traveling block.

The shut off pressure of drilling pumps is, on an average, four times the boiler steam pressure, the ratio between steam and water end areas being approximately four to one in all drilling pumps, with regular liners, so that by noting steam pressure, the circulation pressure may be approximated at the time the circulation cannot be established and the pump runs against a shut off down in the hole and stops against such pressure.

Then, fishing also requires full steam pressure for effective circulation pressure in fishing.

After circulation has been established around lost pipe, water may not loosen it. while oil sometimes will, particularly if the pipe is worked up and down in the hole while the oil is being circulated. Oil seems to reduce the friction hold of sand, or cuttings, or cavings against the pipe. In many cases, oil circulation has freed frozen pipe.

In the Seminole area, stuck pipe has been loosened by circulation as well as pressure and a pull, all at the same time.

All drilling pumps cannot be connected tandem because the suction of all of them are not designed for high pressure. The later designs of drilling pumps, however, with a suction manifold leading directly beneath the suction valves, are sufficiently strong to withstand the pressure of discharge of another pump, and many rigs have the manifold made so that by switching valves, the discharge of one pump may be turned into the suction of the other, for doubling the discharge pressure. Done in a minute or so, a fishing job may be completed before frozen pipe is stuck too hard for pressure to loosen it, and start circulation again.

Use of the Log

If a derrick blows down, or a boiler blows up, or something else happens that stops the rig with the pipe on bottom, and the pipe sticks, as it usually does, the log may show where the trouble is. For instance, in one case where the derrick blew down and the pipe stuck, the log showed gravel and boulders at 1200 feet; a pull on the pipe showed by the stretch of the pipe that the pipe was stuck at about 1200, also.

Using 4-inch drill pipe, 6-inch regular drill may be used for going over the 4-inch, and in the same way, in 11-inch hole, 8-inch pipe may be used for going over 6-inch. This is a particular operation, however, requiring skill and time. Since 8-inch pipe fits rather snugly in 11-inch hole and closely over 6-inch pipe, each joint lowered should be followed by rotating and pumping, to clear the hole and the 8-inch pipe, between the 8-inch and 6-inch, so as to make sure the 8-inch will not stick, too. At mealtime, the 8-inch should be rotated and circulation maintained; in fact, in any kind of fishing job, circulation is always a means of facilitating the job.

In all fishing, careful measurements will determine when the fishing tool is at the fish to insure that no unnecessary weight will be let down that may close an opening, or push the fish out into a soft wall. In one instance, a mistake of one jont of pipe led the driller to try reaming that 20 feet down. Not being able to make it, he found that the reaming bit was on top of the fish, and later fishing showed that running on the fish had swedged its collar, the collar being up, making it impossible to enter, when the collar had to be reamed out.

As a matter of precaution, nothing should be run on top of a fish, unless it be a milling tool with which to cut it up.

When measuring in an open hole, drill pipe with tool joints forms an accurate means, by measuring each stand from shoulder to shoulder. There is some stretch in drill pipe when suspended in the hole, but for fishing purposes, the stretch down to the same point is always the same, hence no allowance or correction need be made, but actual measurements used. Steel tape measurement in open hole is not safe.

There are so many tools and appliances used on the derrick floor that may fall into the hole that a cover for the hole, used while the bit is being changed, is a precaution. A swinging sledge hammer, slipping out of the helper's hand, seems to be always headed for the hole; a broken tong, a table stake, slippery with mud, the bit break out, all may fall into the hole, unless the cover is promptly placed over the rotary table hole.

Impression Blocks

We can get at the upper end only of anything lost in the hole; when it is not known what shape the upper end is, an impression block may disclose the same, so that the proper fishing tool can be run. One type of impression block is shown in Figure 1, which is made out of a swedge nipple, with a block of wood driven into the large end. Numerous 10 penny nails are driven in the block, so that when let down on the fish, an approximate reverse impression is made and outlined by bent nails.

Another type of impression block shown in Figure 2 is made in a swedge nipple, by pouring beeswax into it, securing a better outline of the fish when set down on it.

In both styles of impression block, weep holes in the nipple, above the block, are necessary to equalize fluid pressure in the hole and in the drill pipe used for fishing.

It is not always possible to determine just what is up in a hole. For instance, a job of fishing was set up by twisting off after backing off, leaving two sections of pipe in the hole. One section slipped down alongside the other, as indicated by the first fishing tool touching nothing for several hundred feet below where the top end of the pipe should have been. An impression block showed that a tool joint box was up, and a tap brought that section out; showing twist off at the bottom end, when an overshot brought the other section out.

On another fishing job, there were three sections of pipe in the hole—4-inch pipe in 11-inch hole. We thought there were only two and fished them out, but something at bottom interferred with drilling. Raising the bit until it turned freely, then lowering it slowly, turning the whole by hand, the bit made contact with something 19 inches above bottom. Another impression taken, it showed that blank pipe was up, when a short piece of 6-inch pipe, dented in 6 inches from the lower end, went over the fish and brought it out by friction hold. The hold was so slight that a single tap of a sledge hammer dropped it out of the 6-inch.

The cost of this fishing job was $2984.70, without including fuel and water.

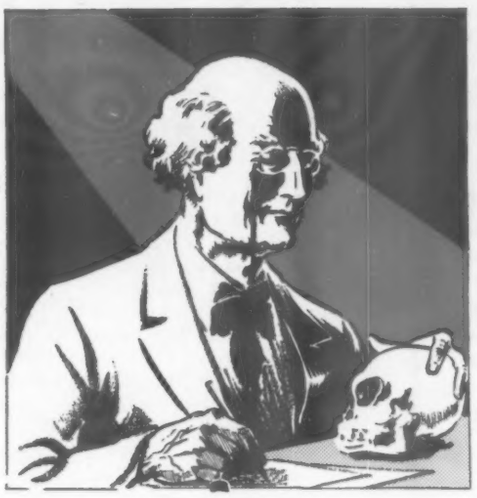
Tools That Grip

The principle of a majority of fishing tools that grip to take hold is that of expanding, or contracting slips. Figure 3 outlines the principle for going over lost pipe, while Figure 4 is for going inside of lost pipe to catch hold.

Slips in the former type may be loosely inserted in the body, with shoulders to prevent them from falling out, or they may be mounted on spring tempered carriers attached to a ring, as shown in Figure No. 15, when the slip, carrier and ring assembly move as a whole to close, or open the slips.

Another principle is that of dogs, Figure 9, placed circumferentially, to pass pipe through until a collar is above the

KNOWLEDGE



There are as many thousands of variations in the chemical make-up of "cut oil" as there are sources of petroleum emulsions. The certain and economical recovery of clean oil from any emulsion is a problem requiring the finest knowledge available.

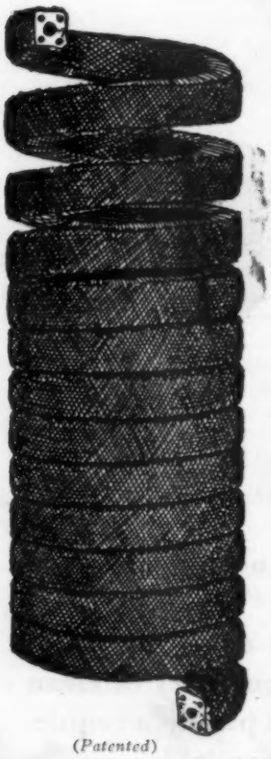
For more than a decade the manufacturers of Tret-O-litE have been accumulating knowledge which is invaluable to producers. A large staff of chemists conducting continual research in fully equipped laboratories ᴛᴛ an organization of field experts who keep in close touch with "cut oil" developments in all districts ᴛᴛ the experience gained in recovering millions of barrels of oil from emulsions ᴛᴛ all these sources of knowledge are behind the success of the Tret-O-litE Process.

Tret-O-litE

WM. S. BARNICKEL & CO.
WEBSTER GROVES, MO.

Say you saw it in The OIL WEEKLY

"Your Packing Solves Our Problem"



(Patented)

Here is what the Vice President of an Oil and Natural Gas Products Corporation has to say about Rhodes Packing:

"In reply to your request regarding service obtained from your packing, wish to advise that we are entirely satisfied with results obtained.

"We had experienced quite a bit of trouble in packing our hot oil pumps, and it seems that your packing has solved our problem.

"We have our entire plant packed with Rhodes Master Packing, but we can call your attention particularly to one installation made about April of last year, which to date is still intact and is rendering the same good service.

"We are, therefore, glad to recommend your packing to whoever might be interested."

Rhodes Master Packing is constructed with the idea of producing a universal metallic packing that can be used on all kinds of fluids and under all conditions.

Ask Your Supply House. We will gladly send a sample on request.

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MASTER PACKING

HOUSTON , , TEXAS

"We Pack the World"

Standard Supply and Hardware Company

Incorporated

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PAINTS OILS AND VARNISHES

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dogs, when the dogs close inward, usually by spring pressure, when a pull may be taken under the shoulder formed by the collar.

There are many modifications of these elementary principles; their universal use indicates that they are adapted to the work, and are successful if the tool is properly designed, and then made of good material, correctly heat treated.

In the latter type of Figure 4—showing the principle of spears—the same principle is shown with slips for expanding. In this, also, there are several modifications, as will be noted from illustrations in this article.

Twisted off pipe may leave a collar up, in the hole, or a tool joint, or the blank end of pipe may be up. Pipe sometimes snaps off clean, but in most cases, it is twisted so that a spear cannot enter, requiring an overshot to go over it. In most cases, the overshot is adapted, for it will go over a tool joint, collar, or pipe, while the varying inside diameter of upset pipe, and tool joint requires an exact size of tool for entering. For instance, if the upset twists off in the collar, or tool joint, the diameter is smaller than if the pipe twisted off intermediate of the two upset ends, but if the pipe threads jump out of collar or tool joint, the diameter is larger, while below, it is smaller.

Therefore, for the majority of cases, the overshot is best adapted. Furthermore, the overshot goes over more easily than a spear can be made to enter.

There is usually sufficient space in a drilling well for the overshot to go over, and what is up in the hole controls the style needed.

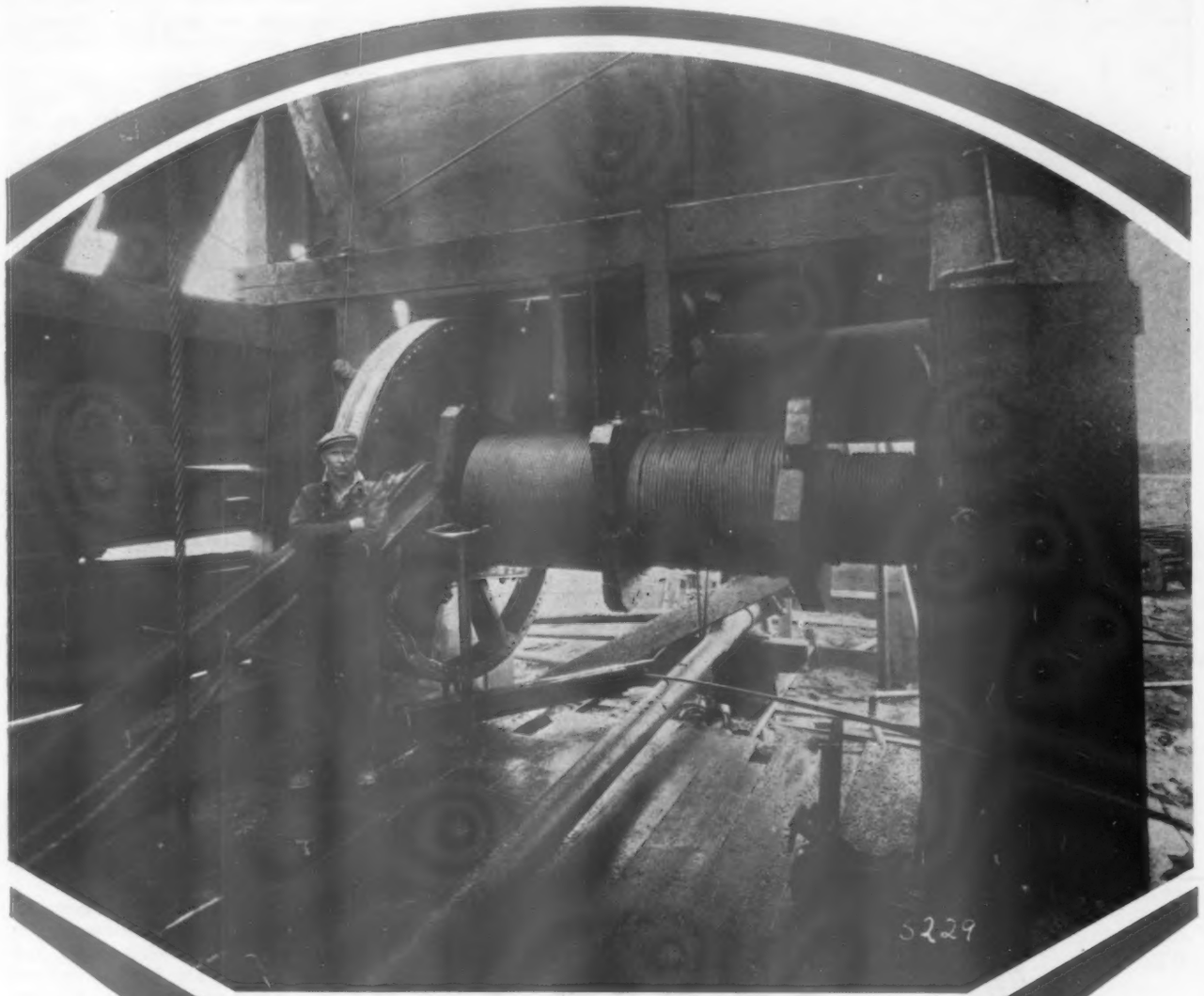
Slip overshots are usually arranged so that one set of slips will go over and catch plain end pipe, while another set, used in the same body, will go over a collar and grip it.

The overshot shown in Figures 5 and 6 is of the releasing type. It has been so successful that it may be detailed. The slips are made from a solid ring, slotted almost to the top, forming an assembly. When pipe enters, the slips rub the pipe somewhat, so that the body may be rotated with the slips stationary against the pipe. By lowering the body slightly, and turning a fraction, the vertical ribs may be placed under the slips, so that when the tool is pulled up, the slips are prevented from sliding in the body and closing, which releases the same.

Slips are set by turning the body until the ribs will slide between the slips, when the tapered section forces the slips into the pipe, gripping the same. In this manner, the slips may grip, or let go, as many times as desired, at will, without coming out.

While no packing means is shown, the same may be applied above the slips, to prevent circulation from passing out of the body, for establishing circulation, or pressure down through the lost pipe.

The overshot of Figure 7 is shown with a lost collar in the same, gripped by slips. The packing ring closes against circulation passing radially outward from the



Union Wire Line on cleaning out string, Phillips Pet. Co.'s Hudson No. 3, North Maud Field. Clyde Thornberg, driller. This line has been in use 7 months swabbing and cleaning out.

EACH UNION LINE IS BUILT FOR ITS OWN JOB

Each UNION Oil Industry Wire Line is built for a particular job by men who know the exacting requirements of the industry. UNION executives are practical oil men; and UNION engineers are experienced in oil field wire line usage. Test UNION Wire Lines in actual use and you'll soon know how good they are.

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JARECKI MANUFACTURING COMPANY
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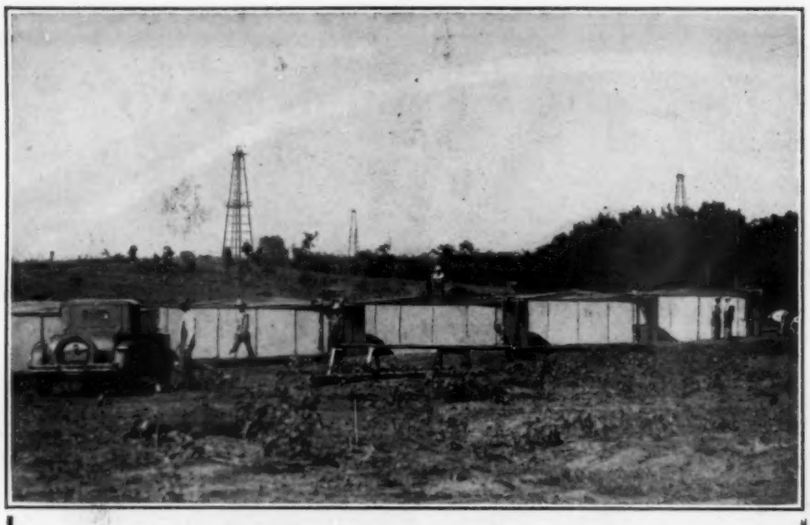
UNION WIRE LINES

Say you saw it in The OIL WEEKLY



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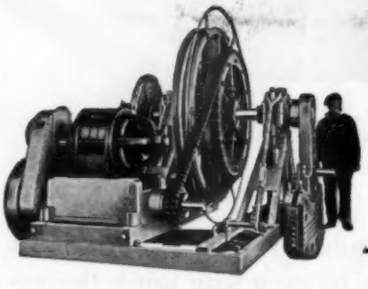

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THE OIL COUNTRY SPECIALTIES MFG. CO.
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lower end of the tool, forcing fluid down the lost pipe, or establishing pressure, when the pump is operated at the surface.

In the dog type of overshot, that of Figure 8 has upstanding dogs, held inward by spring pressure to catch under a shoulder on the fish. This tool has packing placed above the dogs, to establish circulation or pressure downward through lost pipe, and also, by rotating, it may be released if the fish cannot be pulled.

The overshot of Figure 9 has spring dogs, normally inward as shown, and when pipe passes through, the dogs spring outward to catch under a shoulder after the same have passed. This type may be fitted with packing above, to establish circulation down through lost pipe.

The packing type of overshot, Figure 10, is ingeniously devised with spring dogs to catch under a shoulder formed by collar on lost pipe, or in the fishing shoulder of a drill collar.

The overshot of Figure 11 is quite simply made in an emergency, although not as good as some other similar type tools. The dogs are made of spring steel, similar to a light truck spring leaf, and are riveted inside of the pipe as shown.

Usually, this style requires swedging at the upper end, to eliminate a collar, and the size of body may be seven-inch for catching four-inch pipe and nine-inch for six-inch, provided the hole diameter is large enough.

An orphan tool is shown in Figure 12. It may be rigged up in emergency by using the swedge nipples as shown, and a piece of steel of any kind is inclosed as shown. When run over pipe, the piece of steel inside catches the pipe as effectively as any other kind of tool. The piece of steel used for a dog may be fastened with a chain inside, loosely, to prevent it from dropping out, or if the hole diameter is large enough, a piece sufficiently large to stay in the swedge is all that is necessary for fishing for pipe.

If an overshot will not go over the fish, a bent joint on top of the tool will place the tool at the circumference of the hole, as in Figure 13, and by rotating, the tool may go over, when placed immediately over the lost pipe.

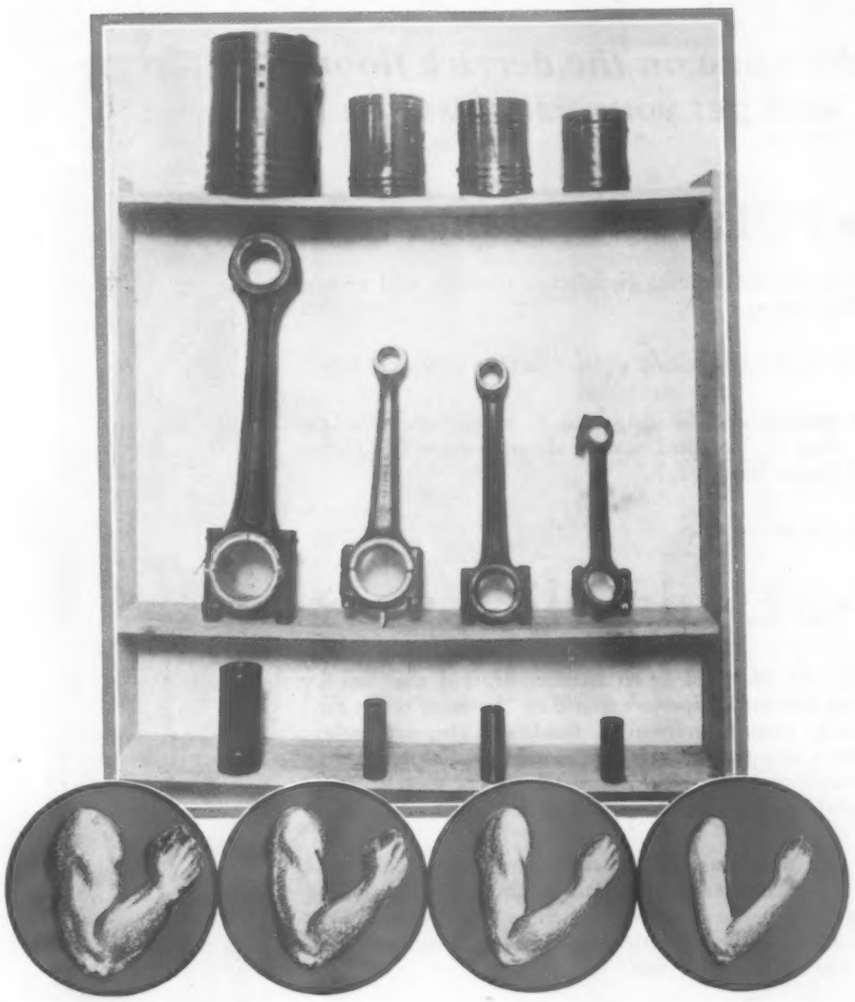
Any kind of fishing tool to go in or go over may be run in this manner.

For fishing out in a cavity, the dog leg tool, Figure 14, will reach out with a tool to strike pipe in the cavity, when raising up, turning and letting down, the tool may go over, or enter lost pipe. This tool is operated to push out sideways by means of pump pressure.

This is the second installment of a comprehensive article on Fishing by Mr. Pennington. A third installment will appear May 17.

YOU MUST HAVE SIZE AND MATERIAL FOR EVERLASTING POWER

RUMELY OilPull TRACTOR 2 3 4



PISTONS

	Weight
OilPull	36 lbs.
2	7¼ lbs.
3	6½ lbs.
4	4¼ lbs.

CONNECTING RODS

OilPull	25¾ lbs.
2	9¾ lbs.
3	8½ lbs.
4	3½ lbs.

CROSS HEAD PINS

OilPull	6 lbs.
2	1 lb.
3	¾ lb.
4	½ lb.

Every possible part is heat treated in one of the finest heat treating plants in the world.

IF everlasting power, endurance and economy mean anything to you, consider the photograph above, which shows the comparative sizes, and the chart to the right, which sets out the respective weights of the OilPull Piston, Connecting Rod and Cross Head Pin, compared with those found in all other tractors with winch attachments.

The First Rumely OilPull Winch Tractors Ever Sold Are Still Working

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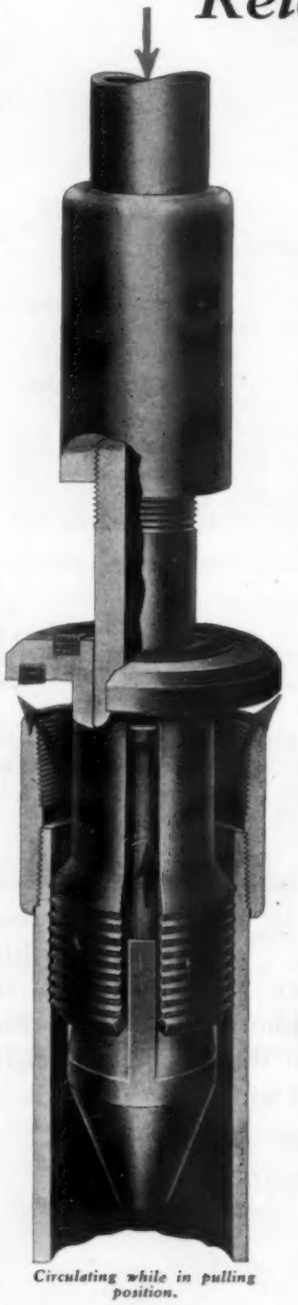
Say you saw it in The OIL WEEKLY

There's MIGHTY POWER *behind the*

EDWARDS HYDRAULIC RAM

Releasing Spears and Overshots



Circulating while in pulling position.

Have one on the derrick floor and get your fish first run

← PULLING POSITION

1 Red arrows indicate circulation through and around pulling string.

2 Spear can be rotated while taking a strain on fish.

3 If pulling and twisting fails to move fish, spudding may start it. To spud, simply drop string a few inches until flange bumps fish.

4 If the above does no good, then

Use Hydraulic Ram →

which will re-establish circulation around the fish by causing the stuck pipe to expand or "breathe" each time the long, rushing column of fluid, and the pumps, are suddenly stopped at each spud with the pumps running. The expanding or breathing of the fish positively forces material holding it outward, thus tending to free it.

5 If for any reason it is desired to release the tool from the fish, this is easily done by dropping the pulling string a few inches, and then turning slightly until keys are out of alignment with slots in slips. The keys then raise the slips out of fish.

6 Flange at top of fish prevents tool going on down in case pulling string breaks.

7 The Edwards Hydraulic Ram Releasing Spears and Overshots are the simplest and strongest made. There are no threads to give trouble in releasing.

Manufactured by HOUSTON ENGINEERS, INC.,
Houston, Texas

Distributed Exclusively by

(Patents Pending)
Keys in position to release Spear.

W-K-M COMPANY, Inc.

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COMPLETIONS FOR PAST WEEK IN U.S. FIELDS

OKLAHOMA

Company, Well and Location	Initial Production BBls.	Depth
BECKHAM COUNTY—		
Day Oil Co., Ault 1, c nw nw 33-8n-21w	*	1515
CARTER COUNTY—		
H. L. Sturm, Fish 2, sw ne sw 35-3s2w	15	993
CREEK COUNTY—		
Magnolia, Musselman 15, nwc ne nw se 8-18-7e	25	2525
Collins et al, Halsell 1, nwc se sw 12-17-11e	10	1205
D. W. Franchot and Mid-Continent, Garrett 2, nw ne sw 16-16-10e	510	2874
B. C. Burnett, Fife 1, nec sw sw 28-18-11e	*	2412
Fusselman et al, Pickett 5, c ne sw 33-17-11e	*	1683
The Texas Co., Posey 1, c w½ se 11-15-10e	*	2800
Madden and Madden, McNac 1, se ne se 34-15-10e	*	3160
F. A. Havell et al, Ramsey 1a, swc ne nw 11-14-10e	*	3184
HUGHES COUNTY—		
Ramsey, Milner 7, ne se se 18-5n-8e	325	2630
Harris Hays Oil Co., Manley 2, csl se se 13-9-9e	¶23	2768
Magnolia Baker 1, sec ne 5-9-11e	*	3625
KAY COUNTY—		
Harris and Haun, Brown 1, swc 9-27-1w, owdd	15	3471
Anoiu Oil Co., Barr 2, owdd, c ne nw 16-27-1w	*	3619
KIOWA COUNTY—		
Engle et al's Kelsey 1, nwc sw 20-7n-17w	*	1045
S. B. Cloys, Brazil 1, swc ne 34-7n-17w	*	1425
Head and Amphlett, Abbott 1, nec sw nw 32-6n-16w	*	460
LOGAN COUNTY—		
Blackwell O&G Co., Quigley 2, ne se nw 28-18-4w	90	4091
MUSKOGEE COUNTY—		
Johnson et al, Lowther 1, nw ne nw 23-13-18e	¶1	679
Robinson Brothers Drilling Co., Brown 1a, sec 18-13-16e	¶½	1015
Colton and Lester's Parker 1, c nw sw 31-12-19e	*	1737
E. A. Smith, Barnes 1, swc se sw 16-13-19e	*	788
Haynes et al's Crittendon 1a, swc ne 6-14-19e	*	885
NOBLE COUNTY—		
Alco Royalty Co.'s Waltermire 1, sec nw 33-21-1w	¶6	3398
OKFUSKEE COUNTY—		
Champlin Oil & Ref. Co.'s Washington 6, sw ne se 15-11-11e	400	3498
Josey Oil Co.'s Fields 3, sw nw nw 33-12-11e	100	3681
Prairie's Bruner 6, owdd, nw se nw 2-9-9	*	3451
OKLAHOMA COUNTY—		
Indian Territory Ill. Oil Co.'s Fortson 1, sec ne 24-11-3w	¶37	3953
Indian Territory's Bodine "A" 1, c nw se 24-11-3w	¶70	4877
Wirt Franklin Pet. Corp.'s Lowery 1, cwl nw 12-11-3w	¶57	4017
OKMULGEE COUNTY—		
J. L. Selby, Conner 12, cnl nw nw 6-14-15e	10	652
H. H. Diamond Oil Co., Jones 1a, cel ne ne 28-13-11e	*	2712
OSAGE COUNTY—		
Tidal Oil Co., 1, swc ne 29-21-11e	25	2011
L. G. Stanley 7, sw nw se 36-22-8e	35	544
Red Bank Oil Co., 1, nw ne nw 29-23-8e, owdd	15	2807
Minnehoma 4, nec sw 11-26-6e	30	2187
Tidal Oil Co., 1, swc ne 25-24-8e	*	2305
Peters Pet. Co., 9, nw se nw 26-25-9e	*	2257
PAYNE COUNTY—		
T. J. Hughes, Powers 2, swc nw 10-18-5e	¶7½	2918

SUMMARIZED REVIEW OF FIELD RESULTS

State—	Completions This Week	Completions Last Week	Producers This Week	Producers Last Week	Gas Wells This Week	Gas Wells Last Week	Failures This Week	Failures Last Week	Initial This Week	Prod. Last Week
Arkansas	5	8	1	4	..	..	4	4	72	1,976
California	14	30	11	29	..	..	3	1	14,200	68,010
Illinois	6	..	2	..	..	..	4	..	180	...
Indiana	7	1	1	..	3	..	3	1	150	...
Kansas	19	..	7	..	1	..	11	..	2,785	...
Kentucky	22	24	16	20	1	..	5	4	754	635
Louisiana	12	17	5	16	3	8	4	3	1,935	375
Michigan	17	6	14	4	1	..	2	2	7,546	2,150
Ohio	47	43	18	16	17	16	12	11	314	597
Oklahoma	79	50	39	22	12	4	28	24	14,169	6,984
Pennsylvania	14	26	6	22	6	4	2	..	75	65
Texas	146	113	78	49	10	13	58	51	16,169	25,303
West Virginia	20	18	5	3	13	14	2	1	641	53
Total	408	336	203	175	67	59	138	102	58,990	106,148
Increase this week	72	..	28	..	8	..	36	..	...	...
Decrease this week	..	..	..	..	..	..	..	..	47,158	...

Company, Well and Location	Initial Production Bbls.	Depth
PONTOTOC COUNTY—		
Denver Producers & Refiners Co., Roberts 1, se ne ne 36-5n-4e	90	2650
Sinclair's and J. A. Hull, Gardner 1, sec nw 6-4n-6e	*	3977
POTTAWATOMIE COUNTY—		
Prairie, Campbell 8, nw se sw 18-8-5e	90	4160
Prairie and T. B. Slick, Davis 3, nw sw ne 18-7-5e	15	4075
Prairie, Davis 4, swc ne 18-7-5e	115	4110
Prairie and T. B. Slick, Nesbit 1, nec nw 18-7-5	500	4260
Nesbitt 2, se ne nw 18-7-5	160	4050
Prairie, Pugh 1, swc se 7-7-5e	30	4082
Amerada, Green 2, sw nw nw 20-8-5e	140	4175
Gypsy, Miller 8, nec se 18-8-5e	60	4080
Miller 7, nw se se 18-8-5e	135	4080
Sinclair, Brandenburg 3, sw se sw 7-7-5e	315	4079
Magnolia, Latimer, owdd, se sw nw 17-7-4e	682	4405
Robbins 3, owdd, sec 15-7-4e	177	4423
Panther Oil Co., Townsite 1, owdd, swc 14-7-4e	375	4288
Atlantic Oil Producing and Darby Pet. Co., Perry 1 ne se ne 13-9-4e	*	4252
SEMINOLE COUNTY—		
Prairie and Skelly, Campbell 4, sw se nw 6-9-6e	715	4153
Prairie and Slick, Cudjo 1, nwc 26-7-6e	400	3191
Villines 1, nwc se 20-8-5e	100	4200
Dixon 1, sec nw 4-8-7e	140	3303
Carter, Factor 1, sec nw 26-7-6e, owdd	¶20	3095
Shell and Papoose Oil Co., Maines 7, ne sw sw 7-8-6e	340	4293
Maines 6, sw nw sw 7-8-6e	295	4168
Empire, Cluck 5, se sw ne 11-8-5e	825	4152
J. S. Cosden, Anderson 1, ne nw sw 13-9-5e	5090	4233
Sunray, Nitchie 3, nw sw ne 19-5n-8e	600	2627
Mid-Continent, Fleet 14, sw nw se 7-5n-8e	220	4216
Sinclair, Davis 1, nw sw se 7-6-8e	955	4164
Independent and Mid-Kansas, Little 1, sw nw ne 26-7-6	¶44	3173
Carter, Factor 2, owdd, sw se nw 26-7-6e	¶35	3250
Amerada, Gross 1, nec nw 24-9-5e	*	4263
Skelly, Gross 1, sw nw sw 36-10-5e	*	4319
Mid-Continent, Fleet 16, nwc se 7-5n-8e	*	....
Prairie, Baker 3, nwc ne 24-9-5	*	3645
Prairie and Slick, Jones 1, nw sw se 6-9-6e	*	4493
Prairie and Slick, Milsap 1, nwc 30-7-6e	*	4557
Prairie and Skelly, Campbell 7, sw ne nw 6-9-6	*	4415
SEQUOYAH COUNTY—		
Buffington O&G Co., Melchor 1, c sw nw 31-12-24e	*	2400
STEPHENS COUNTY—		
Amerada, Richards 1, sw ne ne 19-2s-4w	*	3503

Company, Well and Location	Initial Production Bbls.	Depth
WAGONER COUNTY—		
Cherokee Public Service Co., Marshall 1a, swc ne se 35-16-18e	¶¼	780

KANSAS

Company, Well and Location	Initial Production Bbls.	Depth
BARBER COUNTY—		
Barbara Oil Co., Lytle 1, nec nw 12-33-13w	¶22	4556
BUTLER COUNTY—		
Ed Schreck and Jim Lilly, Teeter 1, sec sw 8-25-7e	*	822
COWLEY COUNTY—		
T. C. Johnson and Shell, Jarvis 1, nwc sw 19-33-6e	*	3555
Pyle and Sutter et al, Lundstrum 1, swc ne 9-35-4e	*	3651
Dutton and Gillespie, Boeger 1, swc ne 21-30-4e	*	2903
GREENWOOD COUNTY—		
Independent, Sheppard 11, se ne nw 11-22-10e	200	2147
Mid-Continent, Wayham 14, sec ne 14-24-12e	25	1740
Rockhill and Taylor, Miller 1, nwc sw 2-25-10e	*	2155
ROOKS COUNTY—		
Krueger et al, Tatkenhorst 1, sw se sw 11-9-16w	*	3584
RUSSELL COUNTY—		
Keyes Pet. Co., Mermis 7, sw ne ne 32-13-15w	*	3360
SEDGWICK COUNTY—		
Bu Vi Bar et al, Roll 1, nwc ne 7-26le	1150	3374
Tidal, Scherger 2, nwc sw nw 6-26-1e	350	3391
Sutter and Pyle, Caldwell 1, nw se sw 6-26-1e	815	3384
Plains Oil Co., School lot 1, nec se se 35-25-1w	75	3414
Phillips, Difford 1, nw ne ne 1-26-1w	170	3405
Bu Vi Bar et al, Nagel 1, nec sw 19-25-1e	*	3500
John Rogers, Fulkerson 1, nwc ne 36-25-1w	*	3460
Robinson et al, Whittaker 1, se sw ne 36-25-1w	*	3466
SUMNER COUNTY—		
Harris and Haun, Mireau 1, c ne nw 23-24-2e	*	3826

EAST TEXAS

Company, Well and Location	Initial Production Bbls.	Depth
HARRISON COUNTY—		
Nick Barbare, Bahan-Furrh A-1, Jas. Short sur.	¶1½	2364
Fuller-Furrh 1, Jas. Short sur.	¶1½	2354

ARKANSAS

Company, Well and Location	Initial Production Bbls.	Depth
CHICOT COUNTY—		
W. S. Smith, Meyer 1, 19-19-2	*	850
Joe Crawford, Cashion 1, 14-18-2	*	2330
UNION COUNTY (Champagnolle)—		
Oil Well Corp., Perdue D-1, 9-17-14	¶5-72	2808

EASTERN STATES

PENNSYLVANIA

Company, Well and Location	Initial Production Bbls.	Depth
GREENE COUNTY—		
Peoples Nat. Gas Co., McNary 3	¶1½	....
Addleman 1	20	....
Greensboro Gas Co., Stewart 2	¶½	3350
Nat. Gas Co. of W. Va., Taylor 1	*	....
J. L. Garard, Margaret 1	5	....
Carnegie Nat. Gas Co. Fox 1	¶½	....
Convex Gas Co., Miller 1	¶½	....
BUTLER COUNTY—		
Bream & Trees, Trees 5	20	....
Phillips O&G Co., McFarland 2	15	....
Harvey 4	10	....
ALLEGHENY COUNTY—		
Walter Hemphill & Co., Hemphill 1	5	....
David Rodgers & Co., Clouse 1	*	....
BEAVER COUNTY—		
L. Reed, Todd 1	¶¼	....
WASHINGTON COUNTY—		
A. V. Lewis & Co., Montgomery 1	¶¼	....

WEST VIRGINIA

Company, Well and Location	Initial Production Bbls.	Depth
WOOD COUNTY—		
South Penn Oil Co., Ogdim 21	4	....
ROANE COUNTY—		
South Penn Oil Co., Stockley 91	415	....
United Fuel Gas Co. Brown-Goshorn 3586	¶1½	....
H. W. Bowers, Snodgrass 1	¶1½	....
CALHOUN COUNTY—		
W. S. Dailey & Co., Maze 1	¶2	....
Weaver 1	¶¼	....
C. S. Lewis & Co., Starkey 1	¶1¼	....
GILMER COUNTY—		
South Penn Oil Co., Ellis 4	205	....
McCall Drilling Co., Riddle Bros. 2	2	....
KANAWHA COUNTY—		
Brawley Oil & Gas Co., Rose 1	¶1	....
United Fuel Gas Co., King Land 2512	¶1	....
JACKSON COUNTY—		
Hope Nat. Gas Co., Center District 776	*	....
H. F. Parsons Oil & Gas Co., Coast 1	¶¼	....
MARION COUNTY—		
Monroe & Laughlin, Morris 2	¶1½	....
Continental Coal Co., Haddix 2	*	....
CLAY COUNTY—		
Virginian Gasoline & Oil Co., Brown-Swan 2	15	....
LINCOLN COUNTY—		
Howard Gas Co., Standard Fuel Co. 1	¶¼	....
HARRISON COUNTY—		
Salem Concrete Co., Williams 1	¶1½	....
RITCHIE COUNTY—		
Robert Elder & Co., Starkey 1	¶½	....
CABELL COUNTY—		
Empire State Gas Co., Savage 1	¶1¼	....

KENTUCKY

Company, Well and Location	Initial Production Bbls.	Depth
OHIO COUNTY—		
Hupp, Duff & Co., Trodgen 5	200	....
James C. Ellis, Keith 11	100	....
H. L. Ogle & Co., Royal 2	50	700
New Domain Oil & Gas Co., Royal 7	30	....
Victor Oil Co., Ralph 3	10	502
Armistead Oil Co., Kelley 3	¶½	....
Ray Bigler & Co., Bourman 2	*	575
DAVIESS COUNTY—		
Wade, Moore & Co., Baird 5	60	....
Baird 4	40	....
Jas. C. Ellis, Howard 3	*	....
MUHLENBURG COUNTY—		
Ohio Oil Co., Kennedy 1	200	1750
ALLEN COUNTY—		
Snowden-McSweeney Co., Tabor 22	3	495
JOHNSON-MAGOFFIN COUNTIES—		
Hupp & Duff, Frazier 8	25	....
Baldwin & Morgan, Vanderpool 4	2	....
Wagner & Matthews, Fairchilds Heirs 3	10	....
Stafford & Co., Williams 1	*	....
Rice 1	*	....
ESTILL COUNTY—		
Superior Oil Corp., Horn 34	2	....
Calmes-Park 1	10	....
WAYNE COUNTY—		
Superior Oil Corp., Burnett Hrs. 29	2	....
George A. Hooks & Co., Rector 1	*	....
WOLFE COUNTY—		
A. Gerard & Co., Bush Heirs 1	10	....

SOUTHEASTERN OHIO

Company, Well and Location	Initial Production Bbls.	Depth
MONROE COUNTY—		
Sylvania Producing Co. Grim 5	40	1715
Woodsfield O&G Co., Turner 4	¶½	1729
F. A. English & Co., English 2	5	....
Shafer Farm Oil Co., Shafer 1	2	....
C. W. Paine & Co. Dean 1	*	....
G. D. Green & Co., Leasure-Marsh 1	*	....
WASHINGTON COUNTY—		
Miracle O&G Co., Klein 3	3	....
John Coffman, Coffman 7	2	870
Caperton & Stalnaker, Scott 1	¶1	1222
Arthur Mackey & Co., Mackey 1	*	....
NOBLE COUNTY—		
Berry & Rich, Rich 2	1	1371
Bell O&G Co., Garrett-Wilson 2	¶¼	1875

CENTRAL OHIO

Company, Well and Location	Initial Production Bbls.	Depth
ASHLAND COUNTY—		
Kemrow & Co., Fluke 4	¶2½	....
Logan Gas Co., Jones 2	¶2½	....
Richards 1	*	....
Metcalf 1	*	....
W. J. Smith, Humm 4	*	....
McIntyre & Co., Gardner 2	*	....
GUERNSEY COUNTY—		
Ohio Fuel Gas Co., Wigginton 3	*	1347
East Ohio Gas Co., Wilson 1	50	3459
Logan Gas Co., Alloway 2	¶1¼	3645
Blackstone & Co., Miles 1	*	3678
LICKING COUNTY—		
Whitehill Gas Co., Ashcraft 8	12	601
Rauber Oil Co., Thrush 6	10	2845
Preston Oil Co., Loar 4	5	768
Ashcraft 6	2	....
SUMMITT COUNTY—		
F. A. Brendall & Co., Swartz 1	¶1	....
Raber 1	¶¾	....
King 1	*	....
ATHENS COUNTY—		
Orondorff & Co., Green 2	1	1430
McFarr & Cody, Runion 2	¶¼	1087
Ohio Fuel Gas Co., Fleming 1	¶¼	1421
MUSKINGUM COUNTY—		
Rymipler Oil Co., Durto 1	75	4037
Pure Oil Co., McKee 1	65	3063
PERRY COUNTY—		
Perry Sturm & Co., Griggs 2	2	2892
Ohio Fuel Gas Co., Bowman 1	*	2785
LAWRENCE COUNTY—		
Penn O&G Co., Brickel 1	¶2	3350
McClay Bros. Albright 1	*	....
HOLMES COUNTY—		
East Ohio Gas Co., Ledbetter 3	¶1	....
Ohio Fuel Gas Co., Harshberger 1	¶¼	....
VINTON COUNTY—		
Co-operative Oil Co., Brooks 2	20	1174
COSHOCTON COUNTY—		
Leonard Oil & Gas Co., Russell 1	12	3288
MEIGS COUNTY—		
Twenty Five Associates Co., Carnahan 7	8	595
WAYNE COUNTY—		
Ohio Fuel Gas Co., Swope 1	¶2¼	....
KNOX COUNTY—		
Ohio Fuel Gas Co., Reed 1	¶1½	....
JACKSON COUNTY—		
Penn Ohio Gas Co., Evans 5	¶½	2696
RICHLAND COUNTY—		
Ohio Fuel Gas Co., Pritchard 1	*	....

NORTHWESTERN OHIO

Company, Well and Location	Initial Production Bbls.	Depth
HANCOCK COUNTY—		
Star & Clark, Stauffer 11	25	1375

INDIANA

Company, Well and Location	Initial Production Bbls.	Depth
VIGO COUNTY—		
Siosi Oil Corp., Williams 6	150	2210
PIKE COUNTY—		
Bement Gas Co., Fettinger 1	¶¼	1026
Mahutska Oil Co., Lindy 1	¶1¼	1565
GIBSON COUNTY—		
Roxana Petroleum Co., Allen 1	¶4½	1431
Gem Oil Co., Barrett 1	*	....
Raiborn 1	*	....
SULLIVAN COUNTY—		
Morris, Whitlock & Co., Maple 1	*	840

ILLINOIS

Company, Well and Location	Initial Production Bbls.	Depth
WABASH COUNTY—		
Ridge Farm Oil Co., Price 6	100	1575
CLARK COUNTY—		
W. C. McBride, Inc., Connelly 4	*	500
ST. CLAIR COUNTY—		
Morris & Yeager, Monsette 1	80	513
Ohio Oil Co., Gaskill 1	*	793
Timberlake & Alspach, Otten 1	*	....
Mt. Vernon Oil & Gas Dev. Co., Becker 1	*	760

MICHIGAN

Company, Well and Location	Initial Production Bbls.	Depth
MUSKEGON COUNTY—		
Dixie Oil Co., McLaughlin 3	1200	2056
Ross 1	1200	2054
Swastika O&G Co., A. Gilbert 2	600	2027
Giles 2	360	2044
Nelson & Witt, Andrea 1	600	2058
Fenner 2	¶1-350	2062
L. R. Henley & Co., Koning 1	750	2023
Travers Oil Co., Smith 1	100	1707
Betty Jane Oil Co., Brand 2	1200	2058
C. E. Marsh & Co., Young 2	100	1700
Citizens-Lake Shore Pet. Co., Nichals	¶5¼	2044
Muskegon Oil Corps., Nichols 2	60	1905
Melbohaco Oil Co., Cook 1	8	1755
Sun Oil Co., Young 1	*	2071
ISABELLE COUNTY—		
Rockford Oil Synd., S. E. Cor. Section 11	538	3518
Leonard O&G Co., McClintic 1	480	3572
OCEANA COUNTY—		
Muskegon Oil Corp. & Co., Zarvel 1	*	1890

CALIFORNIA

Company, Well and Location	Initial Production Bbls.	Depth
BREA-OLINDA—		
Fullerton Oil Co., No. 24	450	5260
FRUITVALE—		
General Pet. Corp., Hensley 3	650	3945
LONG BEACH—		
Dabney-Johnston Oil Corp., No. 30	200	4800
Otis Hoyt, No. 1	2300	6775
A. T. Jergins' Synd., No. 5	600	6765
South Basin Oil Co., No. 5	200	7465
RICHFIELD—		
Continental Oil Co., Santa Fe 1	300	4495
RINCON—		
Chanslor-Canfield Midway Oil Co., Hobson B-7	300	4210
SANTA FE SPRINGS—		
Richfield Oil Co., Howard 3	3000	6500
Universal Consolidated Oil Co., O'Connell 4	4600	6530
SEAL BEACH—		
Marland Oil Co., Bixby 7	1600	5620

NORTH LOUISIANA

Company, Well and Location	Initial Production Bbls.	Depth
BOSSIER PARISH—		
Geo. W. Weatherbee, Fee 2, 21-19-11	*	410
OUACHITA PARISH—		
Moody & Seagraves, Phillips 2, 18-19-4e	¶1.9	2183
RICHLAND PARISH—		
Magnolia Pet. Co., Sartor Co. 1, 5-15-6e	¶47	2400
UNION PARISH—		
Nat. Gas & Prod. Co., Nolan 1, 11-20-3e	¶4	2177
CADDO PARISH—		
D. C. R. Oil Co., Hunter Estate 1, 17-19-14	130	2422

TEXAS GULF COAST

Company, Well and Location	Initial Production Bbls.	Depth
BARBERS HILL—		
Yount-Lee Oil Co., Chambers Co. Agri. Ass'n 5	*	2570
Mills Bennett, Smith 2	1400	5197
BATSON—		
East Batson Oil Co., Donaho & Cashion 13	5	500
BLUE RIDGE—		
Gulf Prod. Co., Invincible Oil Co. 7	900	4250
South Texas Pet. Co., Blakely 1, dd	65	4090
BOLING—		
South Texas Pet. Co., Foytek 1	*	4080
SARATOGA—		
Rio Bravo Oil Co., BBB & C Fee 107	60	960
Gladys Oil Co., Hooks 20	15	1335
PIERCE JUNCTION—		
Smith et al, Parsons 1, dd	60	4315
SOUTH LIBERTY—		
Sun Oil Co., Mitchell 42	1300	3490
Mitchell 43	600	1265
Vacuum Oil Co., Barrett 11	*	2755
Turnbow & Associates, Mills Bennett 1	*	935
The Texas Co., Green 5	1000	3193
J. S. Abercrombie & Co., Reviere 1	300	1910
SUGARLAND—		
Humble, Camp 3	1100	3499

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SOUTH LOUISIANA

Company, Well and Location	Initial Production Bbls.	Depth
EAST HACKBERRY—		
Calcasieu Oil Co., Valery 6	75	3940
HACKBERRY—		
Rycade-Humble, Gulf Land 1, se se 30-12s-10w	*	4333
Gulf Land 2, Sec. 30-12s-10w	600	3965
SULPHUR—		
Union Sulphur Co., Fee 742, Sec. 29-9s-10w	1000	2950

TEXAS

SOUTHWEST TEXAS

Company, Well and Location	Initial Production Bbls.	Depth
SALT FLAT—		
Gulf, Northcutt 1	1000	2680
Carter 8	150	2660
Carter 10	100	2665
Humble, Client Smith 1	100	2720
Shell, New 2	1100	2740
New 4	100	2754
Carter B-3	200	2680
Capps et al, New 1, wo	350	2750
Buchanan, Briscoe 1	*	2795
DUVAL COUNTY—		
The Texas Co., Hahl 3, Schoolfield-O'Byrne pool	90	2353

TEXAS PANHANDLE

Company, Well and Location	Initial Production Bbls.	Depth
GRAY COUNTY—		
Eslick & McKinney, Mrs. J. A. Hopkins 1	*	3262
Mid-West Explo. Co., Bowers 1-B	35	3297
HUTCHINSON COUNTY—		
Phillips Pet. Co., Jasper-Bret 1	¶1½	3125
The Texas Co., J. L. Moore 2	125	3100
MOORE COUNTY—		
Skelly Oil Co., Armstrong-Byrd 7	300	3169
WHEELER COUNTY—		
Lone Star Gas Co., J. Turnbow 1	¶8	1800

CENTRAL WEST TEXAS

Company, Well and Location	Initial Production Bbls.	Depth
BROWN COUNTY—		
Brock & Switzer, Gentry 1	*	812
Humble O&R Co., Armstrong 17	*	1335
Hodnett 22-A	25	1188
Prairie O&G Co., Hartgrove 3	*	1405
Ven-Mex Oil Co., Hickman 7-C	10	1300
CALLAHAN COUNTY—		
Drew Beams et al, Snyder 2	¶1¼	1168
COLEMAN COUNTY—		
Canyon O&G Co., Wesley 1	*	1601
Jameson-Pollard-Foster et al, Shore 1	*	1505
Prairie O&G Co., Roberts 1	*	2428
Shell Pet. Corp., Weaver 1	*	1853
Stepp & Kiester, Shore 2	¶1½	785
TP Coal & Oil Co., Gay 3	*	1475
EASTLAND COUNTY—		
Gholson et al, Fox 2	10	1146
Kirk & Whitesides, Turner 1	25	1319
ERATH COUNTY—		
Hickory O&G Co., Smith 2	¶1½	3367
PALO PINTO COUNTY—		
Upham Gas Co., Wester 2	¶11	1365
SHACKELFORD COUNTY—		
Les Combest Oil Co., Anderson 1	*	780
Frizzell & Smalley, Matthews 1	*	1279
F. W. Holder et al, Huskey 1	*	915
Humble O&R Co., Davis 4-A	*	1925
Prairie O&G Co., Cottle 1	*	2230
Roeser-Pendleton, Inc., Walker 1	*	755
Tannehill et al, Elliott 1	*	720
Texas-Consol. Oil Co., Dyer 1	*	1067
STEPHENS COUNTY—		
Mook-Texas Oil Co., Head 7	15	2150

WEST TEXAS

Company, Well and Location	Initial Production Bbls.	Depth
CRANE COUNTY—		
Gulf Prod. Co., McElroy 62	460	2892
HOWARD COUNTY—		
Cosden & Co., Inc., Roberts 1-C	100	3445
Cranfill & Reynolds, Kloh 1	500	2290
Empire Gas & Fuel Co., Clay 3	40	1812
Humble O&R Co., Clay 1	690	2944
Fred Hyer & Yates, Clay 4	70	1851
Marland Prod. Co., Clay 6	40	1812
Mid-West Explo. Co., Clay 4-C	300	1815
LOVING COUNTY—		
Lockhart & Co., Hubbard Heirs 1	200	4205
WINKLER COUNTY—		
Southern Crude & Westbrook, Hendrick 5-J-T-89	75	2952

NORTH TEXAS

Company, Well and Location	Initial Production Bbls.	Depth
ARCHER COUNTY—		
Brown Oil Co., Brown 2	110	1585
L. T. Burns et al, Portwood 1	*	1505
Continental Oil Co. & Perkins-Cullum, Wilson 1-B	9	1448
F. H. Gholke et al, Wilson 3-B	40	1571
Harry Hines et al, Chancellor 1	*	1557
T. F. Hunter et al, Abercrombie 1	20	1308
Magnolia Pet. Co., May Rutty 10	6	907
L. L. Hudson 13	7	1172
Moran Drlg. Co. & Independent O. & G. Co., Bloodworth 1-B	45	1206
Pandem Oil Corp., Wallace 2	15	1775
Panhandle Ref. Co., Snider 1	*	802
J. B. Peacock et al, Herron 1	*	1010
Inman 1	*	700
Petroleum Prod. Co. & Humble, Falls Fee 1	3	1180
Shappell Oil Co., Jackson 46	†	1600
Shell Pet. Corp., Abercrombie-Taylor 4-C	15	1388
E. J. Stump et al, Hefley 1	*	1849
The Texas Co., Richardson 1-C	*	1500
Underwood Drlg. Co. et al, Wilson 4	15	1627
United Prod. Co. & The Texas Co., Brown 2	*	1600
CLAY COUNTY—		
R. T. Belcher et al, Evans 2	30	1777
Mid-Continent Holding Corp., Evans 1	70	1780
COOKE COUNTY—		
Kewanee O&G Co., Timmis 12-A	*	1536
Timmis 15-A	145	1202
Lloyd Oil Corp., Wheelock 1	8	1316
North Texas O&G Co., Dills 1	*	1781
Shell Pet. Corp., H. L. Dennis 6	40	1266
H. L. Dennis 7	85	1256
Stoneman et al, Bowers & Field 1	*	1485
ELECTRA—		
Golding-Cochran et al, Waggoner Bros 1	*	2006
Harry Hines et al, Burnett 3-A	75	1404
Hines & Humble O&R Co., Waggoner Bros. 2	*	1962
Panhandle Ref. Co., Burnett 3-A	10	1404
Ryan Consol. Pet. Corp., Nance 108	15	1660
The Texas Co., Waggoner Bros. 4	25	1369
Ven Mex Oil Co., Waggoner Bros. 16	60	1328
JACK COUNTY—		
Llewelyn & Knight, O. Loving 1	*	5381
Panhandle Ref. Co., Daugherty-Morrissey 1-A	¶2½-800	3097
Prairie O&G Co., Bryson 2	¶13	3158
MONTAGUE COUNTY—		
The Texas Co., Jones 3	8	1842
K-M-A AND IOWA PARK—		
Bass & Dillard, Woodward 1	*	2007
Comac Oil Co. & Prairie, Bishop 6	25	1800
W. H. Hammon et al, Mitchell 7	70	1327
Riner-Bailey et al, Michie 2-B	260	1791
Staley-Wynne & Co., K. & K. 15	15	1485
Stump & Heydrick, Ferguson 1	175	1791
WILBARGER COUNTY—		
L. G. Bradstreet Co., Waggoner 1-B	70	2385
Eatser Oil Co., Waggoner 3-A	150	2401
Empire Gas & Fuel Co., Waggoner 6-B	255	2329
Waggoner 7-B	100	2323
Lewis & Payne, Waggoner 1	400	2436
Melat Oil Co., Waggoner 5-A	90	1990
YOUNG COUNTY—		
Casey et al, Boone 3	*	565
Cunningham & Ford, Newman 1	*	605
Gifford et al, Miller 1	*	827
Miller 2	*	840
Miller 3	*	804
Miller 4	*	801
Miller 5	*	770
Hawkins et al, Owen 1	160	740
Mid-Texas Oil Co., Calvin 1	*	600
Panhandle Ref. Co. et al, Prideaux 15-C	3	595
Parks & Pennell, McDonald 1	*	798
Seaboard O&G Co., Graham 10	400	4146
Paul Steed & Gaus, Snider 15	30	616
Texas-Unity Oil Co., Haygood 1	*	695
Wise & Jackson, Calvin 7	5	620

ABBREVIATIONS

NOTE—The following is the explanation of abreviations, signs, etc., used in completion and wildcat reports: *—dry hole, abandoned well; ‡—salt water; †—junked and abandoned; ¶—million feet of gas; abn—abandoned; bbls—barrels; b.s.—basic sediment; cas casing; co—cleaning out; dk—derrick; dr—drilling; fsh—fishing; ft—feet; in—inches; lcn—location; m—milling; n, s, e, w—north, south, east, west; r—reaming; sd—shut down; sdtr—sidetracking; sp—spudding; sr—straight reaming; std—standardizing; sw—salt water; td—total depth; ur—underreaming; wo—workover; wosr—waiting on standard rig.

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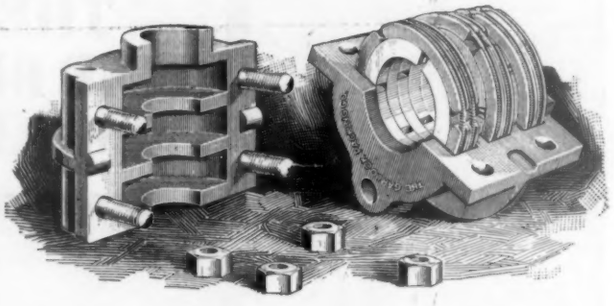
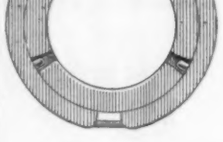


Types of Metal Packing Rings



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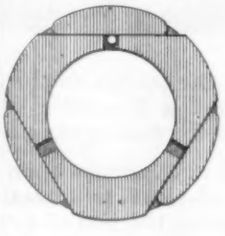

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TEXAS

Operator, lease or owner, acreage, well, survey, distance to lease lines o rwell.

ARCHER COUNTY — Johnson & Fraser, Wichita Falls, L. F. Wilson, 53, A8, B 26, Geraldine sur, 300 ft e of No. 6. L. G. Bradstreet Co., Wichita Falls, S. M. J. Benson, 40, 1, 1808 TE&L sur, 150 ft from s and e lines. Panhandle Ref. Co., Wichita Falls, J. H. Turbeville, 40, A1, B 170, R. Carson sur, 150 ft from sand e lines. Freeman & Grebin, Wichita Falls, Hennig, 60, 5, B 21, G. P. Meade sur, 420 ft w of No. 3. Texas Co., Wichita Falls, W. R. Brown, B 80, 2, Wm. Sellers sur, 500 ft nw of No. 1. Pandem Oil Corp., Wichita Falls, A. Wallace, 30, B 11, DCSL sur, 300 ft e of No. 2. Empire, Wichita Falls, M. Sterrett, 80, 1, S 2, SP Ry. sur, 150 ft from n and w lines of w½ of ne¼. Beavers & Rose, Wichita Falls, S. Hayter, 30, 1, 2402 TE&L sur, 150 ft from n and w lines. Gwynn-Boyd Drilling Co. & Archer Drilling Co., Wichita Falls, Oil Inv. Co., 20, 1, L 15, B 20, Amer. Trib. sur, 15 ft from n and e lines of L 15. Archer Drilling Co., Wichita Falls, A. D. Thompson, 20, 2, L 15, B 20, Amer. Trib. sur, 150 ft from s and w lines of L 12. C. P. Sheldon, Electra, W. H. Chilson, 81, 2, B 2, DCSL sur, No. 3, 600 ft ne of No. 1. C. W. Clark, Wichita Falls, W. H. Chilson, 40, 1, S 24, B 4, DCSL sur, 150 ft from w and 250 ft from s line. Petroleum Prod. Co., Wichita Falls, A. M. Kunkel, 40, 2B, S 3, BBB&C sur, 150 ft from n and e lines. Texas Co., Wichita Falls, Kemp & Kempner, B 200, 2, B 67, WVFL sur, 1472 ft from e and 150 ft from s line B 64. Frank Hutcheson, Archer City, W. T. Hutcheson, 10, B 1, S 123, J. Ostane sur, 150 ft from s and e lines of L 5.

ANDERSON COUNTY—Humble, Houston, A. E. Todd, A 174, 2, D. Clark sur, 600 ft from s and 450 ft from w line.

BROWN COUNTY—W. D. Kynerd, Dallas, H. J. Marr, 20, 1, G. S. Gillespie sur, 150 ft from s and w lines. Jordan Bros., Santa Anna, T. A. Sears, 80, 1, S 610, J. Ross sur, 150 ft from s and w lines. Jas. H. Green & Co., Inc., Borwnwood, M. H. Hill, 38, 4, S 8, S. P. Walker sur, ne corner. C. O. Moore Oil Corp., St. Louis, Mo., J. L. Cross, 25, 2, R. Honeycutt sur, 450 ft from n and 150 ft from w line. Anzac Oil Corp., Coleman, F. M. Brooks, 48, 1, S 115, K. Holstein sur, 600 ft from e and 660 ft from s line S 115. Cranfill & Reynolds, Cisco, H. J. Marr, 45, A2, H. P. Tuggle sur, 150 ft from n and 1339 ft from w lines of S 62. Beasley-Cook Oil Interests, Brownwood, A. B. Dabney, 100, 1, W. H. Wharton sur, 550 ft from n and 1000 ft from w line. A. J. Baker, Zephyr, T. M. Burleson, 40, 1, KCSL sur, 150 ft from e and 450 ft from s line.

BASTROP COUNTY — Gulf Prod. Co., Houston, W. N. Bell C, 287, 2, Riley sur, west central part of lease. Trinity Drillers, Inc., San Antonio, A. Yost, 50, 3, A. Garcia sur, 160 ft s of center of n line.

BEXAR COUNTY — W. H. Kennon, San Antonio, Fee, 400, 3, No. 4 M. F. Rodriguez sur, 2500 ft from e and 1980 ft from s line.

BRAZORIA COUNTY — Empire, Daisetta, Brock, 75, 3p J. E. Groce sur, 2970 ft from e and 479 ft from s line.

CALLAHAN COUNTY — Dickey Oil Co., Cisco, R. D. Williams, 40, 1A, S 25, D&D Asy. sur, 750 ft from n and 870 ft from w line of nw¼ of Sec. 25. Mook- Texas Oil Co. et al, Fort Worth, J. G. Aiken 70, 1, No. 216 R. Mitchell sur, 150 ft from n and e lines. Moutray Oil Co., Abilene, A. Hickman, 390, 42, S 149, BBB&C sur, 296 ft s and 49 ft w of No. 19. Moutray Oil Co., Abilene, P. G. Hatchett, 80, 8B, S 23, D&D Asy. sur, 300 ft s of No. 7B. W. R. Andrews et al, Putnam, R. D. Williams, 160, 72, 2974 TE&L sur, 150 ft from n and 450 ft from e line. Cranfill & Reynolds, Cisco, H. Harris, 160, 1, S 19, BBB&C sur, 1291 ft from e and 2603 ft from s line S 19. Ewmo Oil Corp., Abilene, W. T. Wheeler, 80, 4, S 25, D&D Asy. sur, 300 ft ne of No. 1. M. C. McDonald, Putnam, Texas, A. S. Lobban, 200, 32, 2995 TE&L sur, ne corner. A. J. Breman, Cisco, Hall, 60, 1, S 228, W. W. Woods sur, 150 ft from s and w lines. Moutray Oil Co., Abilene, A. Hickman, 390, 41, S 149, BBB&C sur, 300 ft w of No. 40. P. G. Hatchette 80, 7B, S 23, D&D Asy. sur, 450 ft from e and 420 ft from n line se¼ of ne¼. A. D. McFarlane, Eastland, L. F. Treat, 100, 1, S 13, Bayland Asy. sur, 165 ft from n and 750 ft from w line. L. G. Bradstreet Co., Fort Worth, S. T. Swafford, 25, 1, No. 798 G. M. Vigal sur, 200 ft from w and 150 ft from s line. S. E. Colgin, Dallas, J. C. McDermett 40, 1, B 45, CCSL sur No. 181, 150 ft from n and 450 ft from e line. R. N. Webb et al Cisco, Maltby, 40, 1, S 32, D&D Asy. sur, 160 ft from e and 150 ft from n line. Texas Co., Wichita Falls, P. G. Hanchett, 40, 3B, S 23, D&D Asy sur. York Pet. Co., Inc., Stamford, T. G. Kile, 80, 4, 2280 TE&L sur, 150 ft from w and 450 ft from n line of S 2280.

CALDWELL COUNTY—Humble, Houston, F. Gray C, 48, 1, J. Hinds sur, 150 ft from n and 753 ft from w line; C. F. Dye, 40, 1, J. Hinds sur, 150 ft from s and w lines; T. A. Tiller, 40, 2, J. Hinds sur, 150 ft from n and 429 ft from e line. Texas Co., Houston, M. Merriweather, 100, 8, A. Floyd sur, 150 ft from se and 281 ft from sw line. Shell Pet. Corp., Houston, C. Smith, 33, 1, J. Hinds sur, 150 ft from s and e lines. H. J. Powell, San Antonio, C. Malone, 20, 2, A. Floyd sur, 300 ft sw of No. 1. Gulf, Houston, J. L. Northcutt 23, 2, J. Hinds sur, 300 ft ne of No. 1; 3, 450 ft from ne and 150 ft from nw line; 4, 300 ft sw of No. 3. Shell, Houston, C. F. Dye, 60, 1, J. Hinds sur, 150 ft from s and e lines.

COLEMAN COUNTY—S. J. Taylor, Fort Worth, A. Young, 40, 2, E 192, B 2, B. F. Greer sur, 150 ft from s and e lines of Blk. 2. Eastland Oil Co., Fort Worth, J. P. Morris, 3B, No. 722 Wm. Webber sur, 150 ft from s and e lines of Lot 14. Roth & Faurot, Valera, S. Smith, 640, 1, S 19, B 1, GH&H sur, 330 ft from n and 990 ft from e line of sw¼.

CLAY COUNTY — Mid-Continent Holding Corp., Wichita Falls, City Nat'l Bank, 45, 4, B 7, PCSL sur, 150 ft from n and w lines. Saxet Oil Co., Petrolia, Fee C, 136, 19, L 14, B 13, Chilson sur, 150 ft from s and e lines of Lot 14; F. B. Wyatt, 36, L 3, B 25, Lockridge sur, 150 ft from s and e lines of Lot 3. Merrick & Belcher, Wichita Falls, Hanagan, 40, 3, B 6, PCSL sur, 150 ft from n and e lines. American Ref. Properties, Wichita Falls, Waggoner, 160, 2, S 2, B 65, S. P. Ry. sur, 150 ft from n and 1110 ft from e line.

COLORADO COUNTY — Shell Pet. Corp., Houston, Wm. Frazier 114, 1, J. W. Martin sur, ne corner.

CHAMBERS COUNTY—Chicago Oil Corp., Goose Creek, A. B. Lawrence, 1000, 1 W. D. Smith sur, sw central part of lease. Humphreys Corp., Houston, Kirby, 22, H1, H. Griffith sur, ne corner of lease.

COMANCHE COUNTY — H. H. Martin, Brownwood, W. C. White sur, 100, 1, A. Hobie sur, 150 ft n of center of s line.

COOKE COUNTY — Kewanee O&G Co., Tulsa, Okla., Lanier A, 80, 15, E. T. Ry. sur, 280 ft w of No. 8; 16, 50 ft s of No. 12.

CRANE COUNTY—Gulf, Fort Worth, J. T. McElroy, 619, 63, S 200 B F, CCSD&RGNG sur, 2762 ft from n and 2310 ft from w line of Sec. 200.

CARSON COUNTY—Gulf Prod. Co., Fort Worth, B. F. Block, 160, 1, S 11, B 4, I&GN sur, 330 ft from n and e lines of nw¼.

EASTLAND COUNTY—Chestnut & Smith, Breckenridge, B. Owens, 310, 1, S 48, B 4, H&TC sur, 785 ft from n and 660 ft from w line. A. J. Brown, Fort Worth, Davis, 50, 1, W. A. Holland sur, 210 ft from n and e line (Erath County). Canyon O. & G. Co., Inc., & Crabb & McNeel, Cross Plains, W. F. Turner, 20, 1, S 30, B 2, H&TV sur, 150 ft from n and 750 ft from e line. J. M. Gholson et al, Ranger, C. V. Fox, 100, 2, McLCSL sur, 1025 ft from n and 150 ft from e line. Lone Star Gas Co., Dallas, O. P. Storm, 640, 1, S 470, S. P. Ry. sur, 1980 ft from w and 1760 ft from s line of S 470.

ERATH COUNTY — Fletcher & Moore, Breckenridge, Cage & Malloy, 50, 1, J. Bishop sur, 435 ft from w and 312 ft from s line. A. J. Brown, Fort Worth, Davis, 50, 1, W. A. Holland sur, 210 ft from n and e lines.

FORT BEND COUNTY—Gulf Prod. Co., Houston, L. Wolf, 80, 15, No. 68 H&TC sur, 50 ft s of No. 14.

FALLS COUNTY—O. W. Killam, Laredo, C. A. Jones, 364, 1, W. Hampton sur, 800 ft from nw and 2100 ft from sw line.

FISHER COUNTY—Mid-Kansas O. & G. Co., Tulsa, Okla., H. J. Stephenson, 1, S 26, El Paso CSL sur, 1800 ft from n and 330 ft from e line S 26.

GRAY COUNTY—Camel Oil Co., Pampa, W. W. Harrah, 120, 1, S 150, B 3, I&GN sur, 330 ft from n and w lines nw¼ of ne¼. Phillips Pet. Corp., Bartlesville, Okla., M. Cox, 161, 1, S 58, B B2, H&GN sur, 330 ft from n and e lines of ne¼.

GRAYSON COUNTY—Texas State Oil Co., Fort Worth, G. W. Wall, 40, 1, J. Ingram sur, 293 ft from w and 150 ft from s line. Simpson-Fell Oil Co., Ardmore, Okla., H. Guilland, 160, 1, J. Ingram sur, 150 ft from n and e lines.

GARZA COUNTY—Emerald Oil Co., Winfield, Kas., J. S. Reed, 320, 1, S 135, B 5, H&GN sur, 990 ft from e and 330 ft from s line S 135.

GUADALUPE COUNTY — Magnolia Pet. Co., Dallas, E. Adams, 100, 1, S. Highsmith sur, 150 ft ne of center of sw line.

HARRIS COUNTY — Navarro Oil Co., Houston, Dooley, 16, 3, No. 96 J. Hamilton sur, 50 ft from w and 487 ft from s line; H. C. Cain, 45, 3, No. 98, J. Hamilton sur, 50 ft from s and w lines. Chicago Oil Corp., Goose Creek, Jones, 24, 1, Whiting sur, 100 ft from n and w lines. Texas Co., Houston, Landslide, 808, 263, R. Dunman sur, 508 ft from e and 102 ft from s line. Marland Prod. Co., Fort Worth, E. Cicero, 20, 1, E. Ruhl sur, 150 ft from s and e lines. Marshall & Hesser, Humble, Wheeler-Pickens, 4, 1, Stevenson sur, 50 ft from w and 130 ft from s line B 26.

HARRISON COUNTY — Lyons Gas Co., Shreveport, La., J. W. Furrh, 180, 2, J. Lipscomb sur, 200 ft from s and e lines.

HOWARD COUNTY — Humble, Wichita Falls, W. R. Settle, 640, 1, S 132, B 29,

WEEKLY COMPARISON OF NEW WELLS

Following is a condensed table giving a comparison of permits or locations made for new wells during the past year in Kansas, Oklahoma, Arkansas, Louisiana, Texas, California and the Mountain States:

	Week ending May 4	Previous week	Total this month	Total this year	This week Last Yr.	This month 1928	1928 year total
Arkansas	..	..	..	51	8	8	331
California	..	27	..	477	18	18	1,207
Louisiana	8	27	8	273	13	13	680
Kansas	15	..	15	298	26	26	1,032
Oklahoma	83	86	83	1,060	66	66	3,744
Texas	189	169	189	2,801	203	203	8,297
Total	295	309	295	4,960	334	334	15,291

W&NW sur, 330 ft from s and w lines of S 132. California Co., Colorado, D. Roberts, 160, 6, S 137, B 29, W&NW sur, 990 ft from w and 330 ft from s line s½ of se. Amerada & Rycade, Fort Worth, D. Roberts, 240, 9, S 128, B 29, W&NW sur, 400 ft e of No. 8. Marland Prod. Corp., Fort Worth, H. R. Clay, 11, S 127, B 29, W&NW sur, 210 ft from w and 1520 ft from s line. Otis Chalk, Fee 10, 1, S 124, B 29, W&NW sur 200 ft from s and e lines se¼ of nw¼.

HUTCHINSON COUNTY—Dyck Oil Co., Tulsa, Okla., Weatherley 10, 1, S 18, B Y, M&C sur, center ne¼ of ne¼ of nw¼. Phillips Pet. Corp., Bartlesville, Okla., J. A. Chapman, 80, 4, S 78, B 46, H&TC sur, 330 ft from e and 990 ft from s line e½ of s½.

JEFFERSON COUNTY — Stella Oil Co., Beaumont, Keith-Ward, 1, 8, B 32, Spindletop sur, 30 ft s of center of n line; 9, 150 ft from n and 450 ft from w line. Nederland Oil & Dev. Co., Port Arthur, M. E. Young, 50, 1, T&NO sur, 200 ft from n and 400 ft from w line.

JACK COUNTY—Texas Co., Wichita Falls, J. M. Daugherty, 80, 1, I. Hughson sur, 330 ft from s and e lines. Frank Buttram, Tulsa, Okla., R. J. Boyd, 500, 1, I. N. Wright sur, 250 ft from w and 1460 ft from s line.

JIM HOGG COUNTY—Magnolia Pet. Co., Dallas, Merchant's Bk., 42, S 235, E. Corner sur, 330 ft e of center of w line.

LOVING COUNTY—Lockhart & Co., Pecos, Hazel, 200, 2, S 84, 33, H&TC sur, 330 ft from n and e lines of S 84.

MONTAGUE COUNTY—C. C. Lanier, St Jo, S. J. Hott, 240, 1, E. O'Conner sur, 2380 ft from n and 1544 ft from w line. American Ref. Properties, Wichita Falls, J. A. Hossman, 40, 1, G. W. Tilley sur, 150 ft from n and e lines.

MITCHELL COUNTY — Simms Oil Co., Dallas, Ellwood A, 320 A1, S 33, B 18, S. P. Ry. sur, 660 ft from n and w lines e½ of Sec. Atlantic & Ellis, Dallas, W. L. Ellwood, 80, 1, S 30, B 18, S. P. Ry. sur, 640 ft from s and w lines of sw¼ of sw¼.

PECOS CUONTY—Transcontinental Oil Co., Tulsa, Okla., University, 1, S 9, B 17, Univ. Lands sur, center of sw¼ of sw¼. Plymouth Oil Co., Texon, F. A. Perry, 2, S 29, B 178, T. C. Ry. sur, 330 ft from n and e lines of Sec. 29. Mid-Kansas O. & G. Co., Tulsa, Okla., I. G. Yates D, 640, 7, S 62, B 1, I&GN sur, 821 ft from n and 2824 ft from w line S 62. Sam Kitts et al, Givin, Sherbino, 40, 1, S 52, B C4, GC&SF sur, 330 ft from n and 990 ft from w line nw¼ of nw.

PALO PINTO COUNTY—J. C. Von Arx, Fort Worth, M. J. Jordan, 320, 1, 1745 TE&L sur, 900 ft from w and 500 ft from s line.

PANOLA COUNTY — Natural Gas Prod. Co., Shreveport, La., Floyd, 114, 4, B. C. Jordan sur, nw corner.

REFUGIO COUNTY—Saxet Oil Co., Corpus Christi, C. Heard, 100, 7, B2, Refugio sur, 1050 ft from n and 150 ft from w line.

SHACKELFORD COUNTY—W. H. Ritterbush, San Angelo, J. H. Nail, 160, 1, S 41, E. T. Ry. sur, 660 ft from n and w lines of nw¼. Roeser & Pendleton, Inc. & Phillips Pet. Corp., Albany, B. S. Walker, 320, 1, 382 TE&L sur, 450 ft from sw and 150 ft from se line S 382. T. G. Shaw, Fort Worth, J. Rice, 535, 20, S 20 Bayland Asy. sur, 700 ft from w and 450 ft from s line S 20. Roeser & Pendleton & Marland Oil Co., Fort Worth, W. I. Cook, 640, A3, S 88, E. T. Ry. sur, 516 ft from w and 1153 ft from s line nw¼.

SHACKLEFORD COUNTY—Chas. Gordon, Moran, C. E. Waters, 40, 3, S 61, Univ. Lands sur, 300 ft n of No. 2. Scott & Walker, Albany, E. E. Grother, 40, 4, 567 TE&L sur, 50 ft w of No. 1. McBest et al, Albany, J. M. Isenhour, 40, 1, B 65, N. R. Brisbe sur, 160 ft from e and 450 ft from s line se½ of sw¼ of Sec. R. E. Forrester, Moran, P. L. Chaney, 51, 3, S 41, Univ. Lands sur, 50 ft w of No. 1 sw¼ of sw¼.

STEPHENS COUNTY—Prairie O&G Co., Ranger, R. M. Rogen, 2, S 27, B 5, T&P sur, 250 ft from n and e lines of S 27. Sun Oil Co., Dallas, J. H. McMeen, 160, 1, S 47, B 5, T&P sur, 250 ft from s and w lines of ne¼ 6, 205 ft from w and 754 ft from n line.

TARRANT COUNTY—G. A. S. Dev. Co., Dallas, Boaz, 140, 7, W. Mann sur, 340 ft from w and 1100 ft from s line.

THROCKMORTON COUNTY — Roeser & Pendleton, Inc., & Holder, Albany, R. M. Titus, 80, 3, N. Williams sur, 300 ft e of No. 1.

TYLER COUNTY—Rockland Oil Co., Beaumont, A. E. Caswell, 50, 1, B. Enlor sur, west central part of lease.

WICHITA COUNTY—Reno Oil Co., Wichita Falls, J. E. Roller, 80, 1, S. Holloway sur, 200 ft from n and 150 ft from e line of lot 8. King Royalty Co., Wichita Falls, J. F. Boyd, 40, 3, B 12, J. T. Lewis sur, 300 ft s of No. 2. G. P. Mitcham, Cisco, C. C. Burrows, 60, S 13, Cowherd sur, 650 ft from n and 500 ft from w line. Hi-Land Oil Co., Wichita Falls, L. E. Piper, 30, 2, B 11, J. T. Lewis sur, 300 ft s of No. 1. Culbertson Co., Wichita Falls, J. & J. Waggoner, 465, 58, S 13, BS&F sur, 360 ft n of No. 12. J. M. Hemby, Electra, J. C. Duke, 23, 4, S 20, B 9, H&GN sur, 350 n of No. 3. Standard Oil Land & Leasing Co., Electra, J. C. Duke, 25, 4, S 20, B 10, H&GN sur, 300 ft n of No. 3. J. H. S. Bonner et al, Wichita Falls, Cole, 148, 28, J. McCool sur, 318 ft n of No. 26. Venmex Oil Co. of Texas, Wichita Falls, J. & J. Waggoner, 219, 16, B 9, GC&SF sur, 200 ft from e and 150 ft from s line. Comac Drilling Co., Wichita Falls. L. Morgan, 2, B 818, L. Meadows sur, 150 ft from n and w lines. Venmex Oil Co., Wichita Falls, J. & J. Waggoner, 219, 17, B 9, GC&SF sur, 300 ft n of No. 15. L. G. Bradstreet Co., Wichita Falls, W. T. Waggoner E 73, 1, S 13, HT&B sur, 1350 ft from n and 550 ft from e line. J. A. Fisher, Wichita Falls, Fee, 40, 7, S 24, B 5, L. M. Collins sur, 50 ft n of No. 7. Mrs. Neva R. Temple, Wichita Falls, Fee, 91, 1, B 8, Copeland sur, 600 ft from n and 250 ft from w line. Ryan Consolidated Pet. Corp., Bartlesville, Okla., W. F. Hamilton, 545, 1, J. Beckham sur, 750 ft from n and 800 ft from e line. T. F. Hunter, Wichita Falls, J. & J. Waggoner, 80, 2, S 2, GC&SF sur, 150 ft from s and w lines of Blk. 10. W. C. Forbess, Fort Worth, M. M. Maywood, 148, 3, B 197, Wag. Col. sur, 293 ft from e and 150 ft from s line. Wilson Drilling Co., Wichita Falls, Kemp & Kempner C, 40, 5, B 57, WVFL sur, 150 ft from s and w line nw¼ of B 57. United Prod. Co., Wichita Falls, Kemp & Blair, 20, 1F, B 28, WVFL sur, 450 ft from e and 150 ft from s line B 28. J. G. Rowe et al, Wichita Falls, Waggoner, 46, 2, S 2, B 13, GC&SF sur, 150 ft from n and e lines of Blk. 13.

WILBARGER COUNTY — C. P. Burton-Wichita Falls, W. T. Waggoner J, 80, J1, S 9, B 4, H&TC sur, 150 ft from s and w lines s½ of nw ¼. Melat Oil Co., Fort Worth, Waggoner, A 80, 3, S 10, B 4, H&TC sur, 150 ft from n and e lines n½ of se¼. Waggoner Refg. Co., Inc., Electra, W. T. Waggoner, J 40, J1, S 25, B 4, H&TC sur, 20' ft from n and e lines; J2, 455 ft sw of No. 1; J3, 205 ft from n and w lines. R. R. Robertson, Wichita Falls, W. T. Waggoner, 40, 1, S48, B 4, H&TC sur, 150 ft from n and w lines. Hammond & Hitcham, Wichita Falls, W. T. Waggoner, 80, 1, S 15, B 4, H&TC sur, 150 ft from s and e lines. R. R. Robertson, Wichita Falls, W. T. Waggoner, 40, 3, S 10, B 4, H&TC sur, 150 ft from s and w lines. Waggoner Refg. Co., Electra, W. T. Waggoner, 66, K7, S 31, B 4, H&TC sur, 487 ft sw of No. 6; W. T. Waggoner, L 10, L4, S 32, B 4, H&TC sur, 411 ft nw of No. 3; L3, 411 ft nw of No. 2. Golding & Cochran, Wichita Falls, W. T. Waggoner, J 80, 1, S 17, B 4, H&TC sur, 150 ft from s and w li nw¼ of se¼. Wilbarger Oil Co., Wichita Falls, W. T. Waggoner, A 165, 3A, S 55, B 4, H&TC sur, 300 ft n of No. 1 ne¼ of ne¼. Barkley & Meadows, Wichita Falls, W. T. Waggoner, 40, B1, S 17, B 4, H&TC sur, 660 ft from e and 205 ft from s li ne¼ sw¼. Empire G. & F. Co., Wichita Falls, W. T. Waggoner, 160, 9B, S 32, B 4, H&TC sur, 762 ft from w and 323 ft from s li sw¼. Lewis Prod. Co., Dallas, W. T. Waggoner, A 80, 7, S 18, B 4, H&TC sur, 150 ft from n and 450 ft from e 1 sw¼ of ne¼ Phillips Pet. Corp., Bartlesville, Okla., Waggoner, 40, 2, S 18, B 4, H&TC sur, 195 ft from n and e lines sw¼ of nw¼.

WEBB COUNTY—O. W. Killam, Laredo, A. M. Bruni, 500, 9, B 4, M. Arispe sur, 671 ft from sw and 270 ft from se li s 4.

WINKLER COUNTY—Gulf Prod. Co., Fort Worth, L. Daugherty, B 160, 1, S 22, B 26, 330 ft from s and w lines of nw¼. Southern Crude Oil Purchasing Co., Fort Worth, Hendricks, 160, 4, S 41, B 26. Humble Wichita Falls, J. B. Walton, A 320, 1, S 48, B 26. Magnolia Pet. Co., Dallas, W. F. Scarborough, 400, 2, S 1, B C22, 330 ft from s and w lines.

WARD COUNTY—Gulf Prod. Co., Fort Worth, G. W. O'Brien, 640, 5, S 18, B F, G&M sur, 330 ft from n and w lines of sw¼; Hutchings, 640, 2, S 7, B 0, G&M sur, 330 ft from n and e lines of ne¼.

WHEELER COUNTY—Henry Holmes, Shamrock, J. Close, 40, 1, S 82, B 23, H&GN sur, center of sw¼ of sw¼.

YOUNG COUNTY—Robertson Drilling Co., Fort Worth, F. M. Gilmore, 48, 4, B 14, Y. C. S. L. sur, 150 ft from n and 1050 ft from w li Blk 14. Scott & Nance, Graham, B. Burgess, 80, 1, J. M. James sur, 800 ft from w and 150 ft from n line. Butler & Perkins, Box 113, Olney, D. W. Whitt, 30, 1 ,160, TE&K sur, 150 ft from n and e lines. C. C. Williams, Jean, J. E. Brown, 53, 1, 1388, TE&L sur, 150 ft from n and w lines. Riggs & Oliphant, Graham, C. W. Langston, 45, 2, 1490, TE&L sur, 150 ft from s and w lines nw¼ of nw¼. Wooten & Reed, Graham, J. E. Morrison, 52, 1, S Tynes sur, 458 ft from w of center of e line. Cunningham & Ford, Loving, C. F. Newman, 45, 1, S. Sallee sur, 150 ft from e and 450 ft from s line. Geo. A. Horal, Amarillo, R. L. Morrison, 80, 1, 341, TE&L sur, 250 ft from s and e lines of s 431. Continental Oil Co. & Underwood, Wichita Falls, R. Campbell, 50, 2, 1376, TE&L sur, 200 ft from e and 1325 ft from n line of s 136. Robertson Drilling Co., Fort Worth, F. M. Gilmore, 48, 4, B 14, Y. C. S. L. sur, 300 ft from n and 150 ft from w line of L 14.

LOUISIANA

CADDO PARISH—Gulf, Shreveport, Levee Board A-16, 34-21n-16w, 726 ft s and 233 ft e of nwc ne.

CALCASIEU PARISH — Vinton Pet. Co., Orange, Tex., Matilda Gray 20, Ac. 3, 33-10s-12w, 180 ft n and 314 ft w of sec sw ne.

MOREHOUSE PARISH—Southern Carbon Co., Monroe, La., Tensas Delta 10, 2-20n-4e, 1980 ft n and 1320 ft e of sw cer of Section.

RED RIVER PARISH — Gulf, Shreveport, Kennedy 24, 24-13n-11w, 4634 ft s and 1385 ft e of nwc.

RICHLAND PARISH — Magnolia, Shreveport, M. L. McCoy 2, 29-16n-6e, 660 ft n and 660 ft e of swc se; C. M. Noble 2, 36-16n-5e, 560 ft n and 660 ft e of sw c nw. Northern La. Nat. Gas Co., Monroe, R. A. Boykin 1, 20-17n-6e, 990 ft e and 660 ft n of swc se. Palmer Corp., Shreveport, Mrs. C. T. Wolf 1, 34-17n-6e, 1980 ft n and 2640 ft w of sec ne.

KANSAS

BUTLER COUNTY—Empire, Cranston 8, nw ne se 22-27-5e; Sherrock 2-W, nw ne ne 22-27-5e.

COWLEY COUNTY—Lewis Prod. Co., Sitton 1, se sw ne 30-31-6e.

GREENWOOD COUNTY — Mid-Continent, Wayham 15, nec se 14-24-14e. Paul and Parker, Wiley 1, sw se nw 28-26-11e. Reed et al, Dales 1a, sec 2-22-10a.

HARVEY COUNTY — McCulloch Oil Co., Prouty 1, nwc sw 3-23-1w.

KINGMAN COUNTY—Gypsy Oil Co., Kincaid 1, nec nw 18-29-5w.

RUSSELL COUNTY—Midwest Explo. Co., Baxter 4, ne nw sw 32-13-15w.

SEDGWICK COUNTY—Shawver et al, Scott 1, se sw sw 10-28-1e. Bu Vi Bar Pet. Co. et al, Carr 1, nec se 1-26-1w. Davis, Skelly et al, Wilson 6, sec ne 1-26-1w. Coleman O&G Co., Aley 1, ne sw ne 26-26-1w. Tidal Oil Co., Scherger 3, swc nw 6-26-1e. Derby, Gorman 3, nwc sw 6-26-1e.

OKLAHOMA

CARTER COUNTY — Leonard Woodruff, Zellner 1, nw sw ne, 32-4s-1e.

COTTON COUNTY—Clifford Moore, Moore 2, cwl ne ne sw, 2-2s-10w.

CREEK COUNTY—Murphy Oil Co., Bapham 1, swc ne sw, 35-19-8e. H. U. Bartlett, Bartlett 4, "B," sec ne nw ne, 18-19-9. Miller et al, Irelan 1, sec ne, 4-17-11. G. F. Collins et al, Halsell 2, nec sw sw, 12-17-11. D. W. Franchot and Mid-Continent Pet. Corp., Garrett 4, nec sw, 16-16-10. W. H. Elson and Shell, Harjo 1, nec sw sw, 27-14-10.

HUGHES COUNTY—Magnolia, Reed 6, se sw nw, 17-5-8e. Reed 5, sw nw sw, 17-5-8e.

JEFFERSON COUNTY—Pearce and Brown, School 1, se ne nw, 16-5s-8w. O. V. Beck, Seay 3, swc se sw se, 34-6s-5w.

(Continued on page 99)

WILDCATS FROM ALL SECTIONS

NORTHERN CALIFORNIA

Completions

VENTURA COUNTY—
Star Pet. Co., Conet 1-A, 13-3-23... * 6775

SANTA BARBARA COUNTY—
Shell, Union Sugar 1-A, 25-10-35.... * 3036

KERN COUNTY—
Midway-Northern Oil Co., Brown 1, 29-29-30 . ..... * 3750

KERN COUNTY

BENA—Elmer Oil Co.'s 1, 15-30-30, dr hard sand 1740 ft.

BUTTONWILLOW—Richfield's Redding 1, 36-27-23, dr shale 5165 ft.

GOULD HILLS—Elmer Oil Co.'s 1, 2-29-20, dr shale 2000 ft.

KERN RIVER—Richfield's Boston 1, 20-28-28, fsh for bit 3715 ft. F. M. Sayre's 1, 8-28-28, dr shale 3260 ft.

LERDO—Shell's Ansolabehere 1, dr 3130 ft.

McFARLAND—General Pet. Corp.'s KCL-1, 25-26-25, dr shale 1966 ft.

McKITTRICK—The Texas Co.'s Aldridge 1, 4-30-22, will test at 5015 ft. Ventura-Pacific Oil Co.'s 1, 18-29-22, pumping oil and water 3375 ft.

ROSEDALE—Elmer Oil Co.'s 1, co 2580 ft.

SHALE HILLS—Day Oil Co.'s 1-A, 1-27-18, dr 250 ft. William Gilbert's 1, 35-26-17, will deepen from 750 ft.

SAN EMIDIO—Union's KCL-2, 5-10-21, dr brown shale 2855 ft.

TEMBLOR HILLS — George F. Getty's Phelps 1, 29-31-22, dr brown shale 666 ft. Union's Western Pet. 1, 27-32-23, dr shale 4550 ft; Williams 1, 22-23-23, new lcn.

BAKERSFIELD—Taft Well Drilling Co.'s Matley 1, 2-30-27, ne wlcn.

SANTA BARBARA COUNTY

BUELL CANYON—Union's Buell 1, new rig.

CARPENTERIA—Continental's Franklin 1, sd 4130 ft; Bailard 1, dr 250 ft.

GOLETA—F. G. Anderson's Langman 1, dr out cmt, td 3415 ft. Elwood Cons. Oil Co.'s Rekar 1, 8-4-29, dr gray sand 3400 ft. General Pet. Corp.'s More 1, 21-4-28, 1760 ft. Olympic Oil & Refining Co.'s Palisades 1, 29-4-27, ready to test, td 2440 ft. Padre Oil Co.'s Dos Pueblos 1, 8-4-29, dr shale 2600 ft. Petroleum Securities' Bishop 1, rig. Southwest Prod. Co.'s Pickett 1, 2-4-28, changing to rotary, td 2920 ft.

ORELLA—Shell's Rutherford 1, 36-5-31, sr 3400 ft.

POINT CONCEPCION—Standard's Gerber 1, dr sand 2140 ft. Western Gulf Oil Co.'s Hollister 1, rigged up.

SANTA BARBARA—Channell Oil and Develop. Co.'s Fellowship 1, 29-4-27, dr shale 530 ft. Exeter Oil Co.'s Duncan Ranch 1, dr shale 3862 ft.

SANTA MARIA—Shell's U. S. 2-A, 26-10-35, coring 2000 ft.

SUMMERLAND—American Oil Dev. Co.'s Submarine 1, dr shale 640 ft. George F. Getty's Becker 1, 22-4-26, dr shale 3768 ft. Lincoln Drilling Co.'s Williams 1, new rig. Shell's Ralph 1, 18-4-25, bldg rig.

TORTUGA—Standard's Schyvers 1, dr hard sand 2375 ft.

VENTURA COUNTY

CONEJO — American Oil Co.'s 1, 33-2-20, bailing little oil, td 1055 ft. Triunfo Oil Co.'s 24-1-19, dr sandy shale 1240 ft.

FILLMORE—Federal Oil Co.'s Elkins 1, 5-3-19, pumping oil and water, td 3390 ft.

HUENEME—The Texas Co.'s Eastwood 1, dr hard sand 2320 ft.

LOCKWOOD—Lockwood Valley Oil Co.'s 1, 28-8-21, rig.

MUD CREEK—Superior Oil Co.'s Kirtlan 1, 14-4-21, lcn.

PIRU—Bolsa Chica Oil Co.'s Snow 1, 4-4-18, fsh for bit 400 ft. Pacific Western Oil Co.'s Tehmescal 5, 3-4-28, co 3600 ft.

SANTA PAULA—W. W. Bryant's Anlauf 3, 21-4-21, dr sand 1110 ft. Empire Oil Co.'s 4, 13-4-21, 12½-inch cas cmt 300 ft. San Pedro-

ABBREVIATIONS

NOTE—The following is the explanation of abreviations, signs, etc., used in completion and wildcat reports: *—dry hole, abandoned well; ‡—salt water; †—junked and abandoned; ¶—million feet of gas; abn—abandoned; bbls—barrels; b.s.—basic sediment; cas casing; co—cleaning out; dk—derrick; dr—drilling; fsh—fishing; ft—feet; in—inches; lcn—location; m—milling; n, s, e, w—north, south, east, west; r—reaming; sd—shut down; sdtr—sidetracking; sp—spudding; sr—straight reaming; std—standardizing; sw—salt water; td—total depth; ur—underreaming; wo—workover; wosr—waiting on standard rig.

Pt. Fermin Synd.'s Kellerman 1, 13-4-21, dr hard sand 770 ft.

SATICOY—Standard's Citrus 5, 10-2-22, dr brown shale 5972 ft.

SIMI—Shell's Marr 1, 31-3-17, sr 2838 ft.

VENTURA — California-Ventura Oil Co.'s Lacrosse 1, dr 240 ft. Federal Oil Co.'s Sexton 1, dr sandy shale 1580 ft.

RED MOUNTAIN—Miley Oil Co.'s Casitas 2, 7-3-23, dr hard sand 1175 ft; Oakgrove 1, 11-3-24, lcn.

FRESNO COUNTY—Currency Pet. Co.'s 1, 28-21-14, dr shale 1932 ft. Section 30 Oil Co.'s 1, 30-19-15, dr gray sand 606 ft.

KINGS COUNTY — Dudley Ridge Synd.'s 1, 12-23-19, co 1450 ft.

MERCED COUNTY — Applegate and Renshaw's 1, 24-6-10, dr gray sand 3700 ft. H. L. Kuhn's 3, 8-12-19, dr gray sand 400 ft.

MONTEREY COUNTY—Marland Oil Co.'s 1, 32-24-11, dr gray sand 5060 ft. Shell's Dudley 1, 15-22-9, sr 2270 ft.

POLE CANYON—Union's Paige 1, 8-22-8, lcn.

SAN LUIS OBISPO COUNTY — Midwest Oil and Ref. Co.'s Porter 1, 34-31-15, new lcn. North Star Oil Co.'s 1-A, 5-32-13, dr sand 3532 ft. Painted Hills Oil Co.'s Pecho 1, 34-20-10, changing to cable tools, td 1990 ft. Panorama Oil Co.'s 1, 7-31-21, dr gray sand 3660 ft. Paso Robles Oil Co.'s Emerick 1, 27-27-11, new lcn. T. H. Purman's 1, 12-32-22, fsh for bit 2600 ft. Texas and Pacific Coal and Oil Co.'s Dutton 1, 25-32-14, re-dr 400 ft. Union's Russ 1, dr shale 3520 ft; Chandler 1, 12-32-15, dr shale 3318 ft.

SOUTHERN CALIFORNIA

ANTELOPE VALLEY—Roy M. Christenson's 1, 34-6n-11w, new lcn.

BUENA PARK—Frank Traves' 1, Stanton Ave. and Ninth St., new lcn.

CALABASAS — Pugh-Miller Drilling Co.'s Colyear 1, dr shale 1678 ft.

FULLERTON—Shell's Stern 1, making production test, td 6910 ft; Bastanchury 1, 28-35-10, new rig.

HAWTHORNE—Standard's Freeman 1, dr sandy shale 3535 ft.

INGLEWOOD-POTRERO—California Eastern's Polard 1, 28-2-14, sanded up after flowing oil and water, td 4150 ft. Midland Oil Co.'s 1, rigging up. Petroleum Securities' Parent 1, rigging up. Max Pray's 1, dr brown shale 3776 ft.

NEWPORT—Mesa Pet. Corp.'s B. A. 1, 16-6-10, dr shale 4166 ft.

PIRU—Coast Line Oil Co.'s Mazie 1, dr brown shale 460 ft.

POMONA—Pomona Oil Assn.'s Community 1, 32-1-8, dr hard sand 1100 ft.

PUENTE—Richfield's Didier 1, testing on pump, td 4490 ft. R. C. Rucker's Grazdie 1, rigging rotary.

REDONDO—Allied Pet. Corp.'s Lincoln 1, dr sandy shale 3140 ft. Petroleum Securities' Schwuchow 1, 32-3-14, dr gray sand 4732 ft.

RICHFIELD — Western Drilling and Producing Co.'s Day 1, dr broken sand 2700 ft.

ROSECRANS — Burlingame Pet. Corp.'s Hamm 1, dr brown shale 1366 ft.

VENICE—Ohio Oil Co.'s Del Rey 1, 22-2s-15w, dr shale 4222 ft .

WHITTIER—R. W. Jackson's Flory 1, rigging rotary.

IMPERIAL COUNTY—Imperial Valley Pet. Co.'s 1, 32-11-20, dr sand and shale 2842 ft.

RIVERSIDE COUNTY—L. R. Clark's Banning 1, fsh for dr pipe 2266 ft. Hemet Pet. Co.'s Ward 1, trying for water shutoff, td 3230 ft. Trabuco Oil Co.'s 1, dr gray sand 3740 ft.

SAN BERNARDINO COUNTY — Mahala Oil and Gas Co.'s 1, fsh for 6¼-inch casing 4025 ft. Western Pacific Oil Co.'s 3, running 3-inch liner, td 3370 ft.

SAN DIEGO COUNTY — S. S. Turner's Baker 1, dr hard sand 1850 ft.

OKLAHOMA

GRANT COUNTY—T 28n, R 3w, Sec. 24, Lario O&G Co. et al's Conneil 1, nwc, 6-inch at 3860 ft, ur 5-inch at 4535 ft, top chat 4415 ft, hfw 4435 ft.

WOODS COUNTY—T 27n, R 16w, Sec. 33, Sinclair's Share 1, c ne sw, dr 200 ft.

KAY COUNTY—T 26n, R 2e, Sec. 32, J. A. Vincent & Natl Union's McNeil 1, nwc ne, sd 2795 ft.

HARPER COUNTY—T 25n, R 22w, Sec. 14, Hoffer Oil Co.'s Cooper 1, nwc se se, sd 4182 ft.

WOODS COUNTY—T 25n, R 15w, Sec. 10, Bu Vi Bar et al's 1, sec sw, 1000 ft wtr in hole at 4703 ft in sandy shale, 6-inch at 4750 ft, ur 6-inch, td 5009 ft.

GRANT COUNTY—T 25n, R 4w, Sec. 22, Cowden's Vollner 2, nec se ne sw, lost tools 5640 ft, sd.

WOODWARD COUNTY—T 24n, R 17w, Sec. 32, Otstot Dev. Co.'s Simmons 1, sec, sd 1500 ft.

WOODS COUNTY—T 24n, R 13w, Sec. 18, Miller et al's Capenhaver 1, nwc, spudded and sd.

ALFALFA COUNTY—T 24n, R 11w, Sec. 14, Washoma Oil Co.'s Acre 1, swc ne, rig.

GARFIELD COUNTY—T 24n, R 6w, Sec. 9, Pulse & Beamer's White 1, sec nw, 4755 ft, co to ur 6-inch.

WOOWARD COUNTY—T 23n, Range 20w, Sec. 9, Billy Oil Co.'s Wyatt 1, c se, sand 3200-40 ft, hfw, 8-inch at 3350 ft. T 23n, R 17w, Sec. 2, John Farrand's Belva 2, csl sw se, dr 1050 ft.

MAJOR COUNTY—T 23n, R 16w, Sec. 4, Wilson et al's Creech 1, nec sw, sd 510 ft.

WOODWARD COUNTY — T 21n, R 21w, Sec. 25, Sharon's Elmore 1, swc, sd 3025 ft, rig blown down. T 21n, R 19w, Sec. 15, Burgoyne Bros.' 1, swc se ne, sd 1950 ft.

MAJOR COUNTY—T 20n, R 14w, Sec. 23, Keller et al's Horton 1, c ne ne, spudded and sd.

GARFIELD COUNTY—T 20n, R 4w, Sec. 9, Marland's Looman 1, nec se, 5738 ft, temporarily abn. Sec. 12, Marland's Miller 1, swc, 4586 ft hfw, temporarily abn.

BLAINE COUNTY—T 19n, R 10w, Sec. 13, C. E. Love et al's Phillips 1, c nw sw, dr 450 ft.

DEWEY COUNTY—T 18n, R 15w, Sec. 9, Huckleby & McCoy's Perfect 1, nec, sd 4500 ft.

LOGAN COUNTY—T 18n, R 3w, Sec. 33, Healy & Consolidated Drlg. Co.'s Quier 1, sec sw, sd 3970 ft.

KINGFISHER COUNTY — T 16n, R 6w, Sec. 27, Crawford & McKenna's Sturgeon 1, nec sw, sd 4895 ft.

CANADIAN COUNTY—T 16n, R 6w, Sec. 27, 9, A. D. Spears Piatt 1, swc ne, sd 3223 ft.

CIMMARON COUNTY—T 5n, R 5 ECM, Sec. 22, Magnolia's School Land 1, c se ne, sd 2640 ft.

TEXAS COUNTY—T 1n, R 15 ECM, Sec. 25, Skaer et al's Hitch 1, nwc, rigged up and sd.

OSAGE COUNTY—T 26n, R 7e, Sec. 13, Wrightsman's 1, sec nw, moving in machine.

LINCOLN COUNTY—T 16n, R 4e, Sec. 15, J. V. Bailey et al's House 1, c ne se, dr 3900 ft. T 16n, R 5e, Sec. 2, L. G. Wheeler Mote et al's Wolfe 1, nwc ne sw, dr 3655 ft. T 16n,

R 6e, Sec. 19, Flynn & Morgan's Finely 1, swc dr 1075 ft. T 12n, R 3e, Sec. 29, Phillips' Robertson 1, sec nw, rig.

McINTOSH COUNTY—T 12n, R 18e, Sec. 15, A. B. Wolfe et al's Beck 1, nwc se, spudded and sd.

PITTSBURG COUNTY—T 9n, R 16e, Sec. 32, Pattison et al's McDuff 1, swc nw se, Wilcox 5443-92 ft, show of oil and gas.

HASKELL COUNTY—T 9n, R 18e, Sec. 10, Marion Oil Co.'s Sanders 1, nwc ne sw, sd 1800 ft.

LATIMER COUNTY—T 5n, R 18e, Sec. 15, Limestone O&G Co.'s Murray 1, swc, 1½ mil ft gas at 2518-30 ft, small show gas 3380-3400 ft, 6-inch at 3540 ft.

OKLAHOMA COUNTY—T 12n, R 2w, Sec. 30, Magnolia's Noble 1, nwc sw sw, cemtg 10-inch 4075 ft, td 4078 ft. T 12n, R 3w, Sec. 15, Cromwell's Thompson 1, swc ne ne, fsh 7182 ft.

OKFUSKEE COUNTY—T 11n, R 7e, Sec. 21, Slick's Wolfe 1, sec ne se, ur 6-inch at 4530 ft, ts 4720 ft, td 4722 ft, water, dry and abandoned.

CLEVELAND COUNTY — T 10n, R 2w, Sec. 8, Slick & Phillips' Sudik 1, c ne ne, 9-inch casing at 5500 ft, dr 5525 ft.

SEMINOLE COUNTY—T 10n, R 6e, Sec. 16, McCulloch et al's Hollis 1, sec nw, dr 4397 ft, hfw. T 10n, R 7e, Sec. 5, Marland et al's Strothers 1, nwc se ne, 6-inch at 4833 ft, ts 4884-4916 ft, top 2nd sand 4925-42 ft, hfw, plugging. T 8n, R 8e, Sec. 4, McCulloch's McGilbray 1, swc ne, dr 4100 ft, hfw.

CLEVELAND COUNTY—T 7n, R 1w, Sec. 15, Sooner Oil Co.'s Vandeveer 1, nec nw sw, sd 3120 ft.

POTTAWATOMIE COUNTY—T 6n, R 4e, Sec. 19, Simms Pet. Co et al's Lester 1, sec ne ne, top Viola lime 3640-3699 ft, flowing 3000 bbls. 40 gravity.

SEMINOLE COUNTY—T 6n, R 5e, Sec. 11, McCulloch's Powell 1, nwc, rur. T 6n, R 7e, Sec. 34, Magnolia's Harjo 1, nec se, dr 3968 ft.

PONTOTOC COUNTY—T 5n, R 4e, Sec. 36, Denver P&R Corp.'s Roberts 1, sec ne ne, top Wilcox 2838 ft, td 2853 ft, hfw, pb to 2650 ft in Simpson, shot 60 qts, 90 bbls, 38 grav.

HUGHES COUNTY—T 5n, R 9e, Sec. 17, E. W. Whitney's Huddleston 1, sec sw, ur 5-inch at 3660 ft.

PONTOTOC COUNTY—T 4n, R 8e, Sec. 23, Independent's Hampton 1, nec, ur 10-inch 2359 ft, hfw.

PITTSBURG COUNTY—T 4n, R 12e, Sec. 32, Kerr & Key's Tall 1, c nw nw, fsh 1805 ft.

COAL COUNTY—T 2n, R 8e, Sec. 6, J. S. Cosden's Richardson 1, nwc ne ne, ur 10-inch 1800 ft. T 1n, R 9e, Sec. 24, Galbreath et al's Jones 1, swc se, fsh 3350 ft. T 1n, R 11e, Sec. 10, I. T. I. O.'s Cook 1a, sec sw nw, sd 7038 ft.

CUSTER COUNTY—T 14n, R 14w, Sec. 1, W. E. Witt's Wellman 1, c se, sd 100 ft.

ROGER MILLS COUNTY—T 11n, R 26w, Sec. 4, L. C. Hivick's Davis 1, c nw ne, sd 700 ft.

CANADIAN COUNTY—T 10n, R 6w, Sec. 1, J. V. Bailey's Robinson 1, c ne nw, spudded and sd.

BECKHAM COUNTY—T 8n, R 25w, Sec. 30, Benedum & Trees Oil Co.'s Rogers 1,swc, dr 1685. T 8n, R 22w, Sec. 20, Carson et al's Denby 1, swc se ne, small show gas, fsh 1435 ft. T 8n, R 21w, Sec. 33, Day Oil Co.'s Ault 1, c nw nw, dry and abn, 1515 ft.

KIOWA COUNTY—T 7n, R 17w, Sec. 34, G. B. Cloyes' Brazil 1, swc ne, small show oil at 908-918 ft, dry and abn at 1425 ft.

CADDO COUNTY—T 6n, R 10w, Sec. 22, English Drlg. Co.'s Jacobs 2, nwc se, sd for repairs 3465 ft.

JACKSON COUNTY—T 1n, R 20w, Sec. 4, Houseman et al's Northington 1, nec, sd 2020 ft.

KIOWA COUNTY—T 1n, R 17w, Sec. 13, Allen Bros.' Howell 1, nwc se, show oil 599 ft, dr 705 ft. T 2s, R 16w, Sec. 6, Landfair's 1, sec sw se, sd 2535 ft.

COTTON COUNTY—T 2s, R 12w, Sec. 31, Pearce & Brown's Heitzler 1, nwc, sd 2716 ft. T 3s, R 12w, Sec. 11, Consolidated Oil Co.'s Indian 1, nec sw, dr 2343 ft. T 3s, R 10w, Sec. 11, E. J. Stump's Jones 1, nwc ne, sd 2513 ft.

STEPHENS COUNTY—T 3s, R 9w, Sec. 22, Pelwin Oil Co.'s King 1, swc se, sd 520 ft.

COTTON COUNTY—T 4s, R 9w, Sec. 31, Amerada's Delana 1, sec nw nw, dr 1610 ft.

JEFFERSON COUNTY—T 5s, R 7w, Sec. 35, Amerada et al's Major 1, sec nw nw lcn.

McLAIN COUNTY—T 5n, R 2e, Sec. 31, Tidal et al's Haberson 1, c se se, rainbow show of oil at 4124-30 ft, dr 4150 ft.

GARVIN COUNTY—T 3n, R 3w, Sec. 36, Gilcrease-Douglas Oil Co.'s Barnett 1, sec nw ne, dr 3700 ft.

MURRAY COUNTY—T 1n, R 2e, Sec. 17, Revels & McGee's Wolfe 1, nwc, dr 2228 ft, 300 ft black oil in hole.

JOHNSTON COUNTY—T 1s, R 7e, Sec. 29, Smith-Kinsley's Lane 1, sec nw, fsh 1900 ft.

CARTER COUNTY—T 4s, R 2e, Sec. 32, Tex-Okla. Drlg. Co.'s Anderson 1, sec ne se, sd 420 ft.

BRYAN COUNTY—T 9s, R 9e, Sec. 36, W. G. Endicott et al's Craig 1, c nw ne, fsh 1390 ft.

MOUNTAIN STATES

COLORADO

ARCHULETA—Juanita Oil Co.'s Harvey 1, sw 4-32n-3w, stand 735 ft., bad roads.

BENT—Marland Oil Co.'s Pipe Springs 1, se 27-29s-49w, prep to resume.

ELBERT—Progressive O. & L. Co.'s Pease 1, sw 27-10s-60w, spd 70 ft.

JEFFERSON—Ruby Hill O. & G. Co.'s Braden 1, se 14-4s-69w, dr 1751 ft.

LAS ANIMAS—Parker Club-Kinney Coastal, 4-28s-68w, sd 3008 ft. Okla-Colo O. & G. Co.'s Doherty 1, sw 32-34-60w, fsg 1017 ft.

LARIMER—Barrows et al., 7-11-68w., sd 2000 ft.

LAPLATA—Royal P. & R.'s Red Mesa 1, 27-33n-12w, ready to resume at 567 ft.

LINCOLN—Kelly Oil Co.'s State 1, ne 36-14s-57w, stand 1600 ft.

MESA—Peerless Oil Co.'s Hoel 1, ne 23-8s-104, dr 2505 ft. Parrish & Langston, D. & R. G.'s Western 1, nw 23-1s-1w, sd 417 ft.

MOFFAT—Mtn. Fuel Supply Co.'s State 1, 16-12-100, fsg 3585 ft, td 3600 ft. McLaughlin et al's Wms 1, 2-3n-91w, dr 3345 ft. McCormick et al's Sales 1A, se 28-4n-92w, spd 15 ft and sd.

MONTROSE—Uncompaghre O. & G. Co.'s Colorado Title & Trust 1, 27-50n-10w, dr 2000 ft.

PUEBLO—Continental Oil Co.'s Shaw 1A, nw 3-22s-63w, dr 250 ft. Christopher Oil Synd.'s Stanbeck 1, nw 19-22s-63w, stand 1070 ft. Christy-Frantz Corp.'s Mannerich 1, sw 34-21s-63w, sd 1130 ft. Sheffer et al., 1, se 4-22s-63w, dr bel Dakota sand. Security Oil Trust's Bush 1, nw 14-22s-63w, dr 720 ft. G. E. Stevenson et al's Isis 1, ne 1-23-63--, wait cas, td 620 ft. Sundance Oil Co.'s Lubers-Oliver 1A, 35-21s-63w, ready to spud. Amarillo Prod. Co.'s Pahl 1, nw 35-22s-63w, dr 1000 ft.

RIO BLANCO—White Eagle O. & G. Co.'s Fordham 1A, sw 9-2s-96w, spd 45 ft.

YUMA—Major Pete., Inc.'s Black Wolf 1A, sw 7-2s-43, ready to spud.

WELD—Platte Valley Pete Corp.'s Patterson 1, sw 23-8n-61w, 6¼-inch cem, td 4180 ft.

NEW MEXICO

CHAVES—Snowden & McSweeney's Merchant 1, ne 27-15s-23e, dr at 4275 ft. R. T. Neal et al's Russell 1, 31-14-25e, fsg 1385 ft. Warman et al's 1, sw 23-13s-24e, sd. Tannehill et al's Butler 1, se 15-21s-24e, dr 965 ft. Transcontinental's Robert 1, 1-14s-28e, casing at 2450 ft.

DEBACA—Matador Oil Co.'s State 1, sw 6-4n-20e, dr 760 ft. Pittsburg Oil Co.'s 1, ne 16-1s-27e, dr 4425 ft. Transcontinental's McWhorter 1, 6-35-22e, dr 3955 ft.

GUADALUPA—Hanchett Oil Co.'s 2, 14-8n-24e, sd temp 2400 ft.

LEA—Midwest's Gregory 22, sw 31-25s-37e, dr 160 ft; Capps 31, sw 3-19s-39e, dr 1245 ft; Farnsworth 19, 12-26-37e, to abdn 4115 ft. Gypsy Oil Co.'s Mattern 1, 24-21s-36e, fsg 3125 ft. Exploration Co.'s Record 1, 26-19s-35e, td 4556 ft. Morton et al's State 1, ne 32-11s-38e, dr 1878 ft. Texas' Sheppard 1, ne 6-26s-37e, spray oil 3230 ft. Cranfill & Reynolds' Scott 1, se 29-25s-37e, dr 2685 ft. Curtis Dr Co.'s Nixon 1, 22-18s-34e, sd 1200 ft. Empire Gas & Fuel Co.'s Shate 2B, se 8-21s-35e, rig up; Clossen 1, se 6-22s-36e, ready to spud. Texas-Pacific Coal Co.'s State 1, sw 22-23s-35e, dr 3655 ft. Henderson et al's McDonald 1, se 18-20s-34e, stand cem 3166 ft. Vacuum Oil Co.'s 1, 14-17-34, show 5M gas at 3900 ft. Bordages et al's Hughes 1, 27-19s-38e, prep to resume 4012 ft. Pueblo Oil Co.'s Scott 1, se 29-25s-37e, dr 2662 ft. Rector Oil Co.'s King 1, sw 27-25s-32e, operation susp. Maljamar O. & G. Corp.'s Simon 1, ne 29-17s-32e, location. Ohio Oil Co.'s State 1, sw 9-19s-38e, ready to spud.

McKINLEY—J. W. Halsell's Santa Fe 1, 17-18n-9w, dr 1100 ft. San Juan Coal & Oil Co.'s 1, se 27-18n-9w, dr 1195 ft.

ROOSEVELT—J. T. Keegan et al's Pepper 1, 6-1s-36e, ready to spud. Smith & Sloan's Lovern 1, se 4-3s-35, dr 915 ft.

RIO ARRIBA—Berringer et al's Hartman 1, ne 8-29n-7w, 12½-inch at 520 ft.

SAN JUAN—Continental Oil Co.'s Munoz 17, 2-29-19, ur 4¾-inch below 6730 ft. Dorothy Oil Co., 29-30-9, mvg in new equipment, 712 ft. Kutz Canon O. & G. Co.'s Day 1, 29-28-11, stand 722 ft. Blackrock Oil Co., 1, sw 11-25s-13w, to resume soon under new contract. Iowa Oil Synd.'s Viles 2, 28-29-11, sd 694 ft. Angel Peak Oil Co.'s Kutz Canon 1, 11-28n-11w, dr 3100 ft. Great Mesa Oil Corp.'s Roderick 1, sw 11-22n-14w, dr 215 ft. Milwaukee-N. M. Synd.'s Beardsley 1, 30-28-11w, trouble with frozen pipe 1700 ft. Childers D. & P. Co.'s Westwater 2, nw 24-31-18s, dr 2340 ft. Reserve Oil Co.'s Shaffer 2, ne 1-21n-14w, dr 100 ft.

SAN MIGUEL—Benedict-Wilson 1, ne 25-17n-16e, sd 800 ft. Pioneer O. & G. Co.'s Thunderbird 1, nw 14-15n-16e, dr 1838 ft. Starr Oil Co.'s Adams 1, ne 25-17n-16e, dr 660 ft.

SOCORRO—Arnold et al's 2, ne 13-6s-1w, sd 1975 ft.

TORRANCE—Bluhall O. & G. Co., 20-6n-10e, dr 1800 ft. Hall et al's Pinos Wells 1, sw 25-3n-13e, stand 400 ft. Sinnock et al's Kutchin 1, ne 13-7n-7e, stand 117 ft.

VALENCIA—Rio Puerco Oil Co.'s N. M.-Ariz Land Co. 2, nw 13-6n-2w, wait pipe 3145 ft. Acme Oil Co.'s N. M.-Ariz. Land Co. 1, 26-6n-3w, stand cem 3670 ft.

WYOMING

BIG HORN—P. & R. 3, 24-56-98, rigged rotary, td 2708 ft; South Frannie 1, 7-57-97, boiler repairs, 1950 ft. Cody Pete 1, sw 27-57n-96w, sd 1415 ft. Ohio Oil Co.'s Pulley 2, 27-52-101, operation suspended. Cross Gas Co., 1, 23-56-97, water in Sundance 4020 ft. Forsman Bros., 17-57-101, fsg 2000 ft.

CARBON—P. & R., 2-19-88, sd 4003 ft.

CONVERSE—Criterion Oil Co., ne 5-31-70, ready to resume 3600 ft.

FREMONT—P. & R.'s Muskrat 2, nw 1-33n-92w, location. Kinney-Coastal, 22-3n-1w, dr 2200 ft, re-run 10-inch.

HOT SPRINGS—Texas Prod. Co., sw 23-45n-100w, string 13 3/8-inch to 1960 ft. MacPherson Oil Co., sw 2-44n-98w, set 5 3/16-inch and dr ahead 3317 ft.

LINCOLN—Midwest Refining Co.'s Waterfall 1, 35-22-115, dr 2860 ft. O. M. Topley, Sage structure prep to resume at 450 ft.

PARK—California Expl. Co. and P. & R.'s Pitchfork 1, 12-48n-102w, cem 20-inch at 225 ft. Midwest's Rosenburg 36, 25-58-98, cem 2060 ft; Kirk 36, se 23-56n-98w, dr 2775 ft. Cody Pete Co., 1, ne 4-54n-102w, dr 3510 ft; 1, 16-53-89w, dr 2775 ft; 1, ne 4-54n-102w, dr 3510 ft; 1, 16-53-101, bldg rig. Oregon-Wyoming Oil Co., 31-51-101w, spd. Grebo Royalties, 2-47n-100w, sd 1700 ft. Resolute Oil Co., nw 17-57-101, fsg 2215 ft. Henderson Prod. Co., 31-58-99, try mud off gas.

SWEETWATER—Mtn. Fuel Supply Co.'s Tucker 1, 18-13-99, sd 2480 ft; Humphreys 1, 2-12-101, wait cas 3550 ft; Otto Arnold 1, 24-19-104, set 13 3/8-inch at 1740 ft. P. & R. 1, 26-20-104, circulating to kill gas, 6¼-inch set at 3500 ft. Vermillion Oil Co., sw 16-12-99, ready to resume at 620 ft.

SUBLETTE—California Co.'s Wyss 1, 12-32n-115w, run cas, td 1608 ft; Buchell 1, 11-29-115w, sd 2503 ft.

UINTA—California Co.'s U. P. 1, 7-17-119w, dr 3026 ft. H. Allen Rispin's LeRoy 1, 5-16-115w, sd 2503 ft.

UINTA—California Co.'s U. P. 1, 7-17-119w, dr 3026 ft. H. Allen Rispin's LeRoy 1, 5-16-117w, prep to resume.

WESTON—Continental Oil Co., 1, 11-45-64, will deepen from 1000 ft. California-Wyo. Drill Synd., 15-44n-64w, oil show 4350 ft, discovered when co hole.

MONTANA

BROADWATER—Swoboda et al., 1, 36-7n-2e, dr 625 ft. New Day Oil Co., nw 29-5n-1e, dr 850 ft. Conrad McDonald, nw 7-8n-1e, skdg ro new location.

BLAINE—Ohio Oil Co.'s Winngert 1, 3-34n-32e, sd engine repairs, td 3410 ft.

CARBON—Ohio Oil Co.'s Northern Pacific 2, 11-7s-21e, cem 20-inch at 80 feet.

CASCADE—U. S. Pete Co.'s Miller 1, 8-21-

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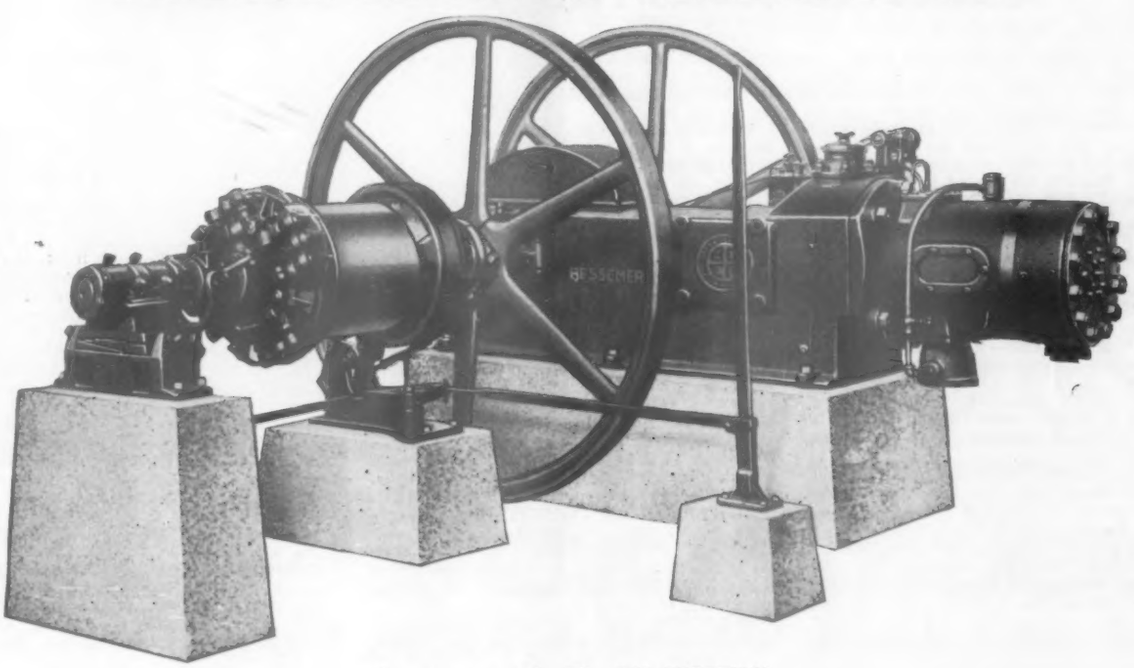

4w, dr 958 ft. Lone Star's McLean 1, 13-21n-3e, dr 788 ft. Rothrock & Reynolds' McIver 1, se 12-20n-2e, dr 200 ft. Eden Oil Co., sw 27-18-4e, dr 630 ft.

CHOTEAU—Geraldine O. & G. Co., ne 1-21-11e, dr 1735 ft. Williston-Shelby O. & G. Co., 1, 12-28-11e, sd 2765 ft.

CUSTER—Montana Belle Oil Co.'s Loesch 1, 28-8n-45e, dr 2650 ft.

FERGUS—Minn. Pete., 1, sw 5-12-25e, resum at 1110 ft.

GALLATIN—California Co.'s Ringling 1, 35-5n-7e, dr 983 ft.

JUDITH BASIN—Gem Oil Co., 15-16-10e, rig up.

LIBERTY—Sunburst O. & G. Co.'s Bear's Den 1, nw 17-36-6e, light oil show at 1753-58 ft. Square Deal Pete Co.'s Johnson 1, se 1- 32-7e, ur 5¼-inch, td 3230 ft. Mid-Rockey Dev. Co.'s Federal Lands 1, 7-35-7e, sd 1500 ft. Western Nat'l Gas Co.'s Morrison 1, 5-37-4e, dr 900 ft. Cypress Oil Co.'s State 1, 36-28-6e, temp sd 1900 ft, await equipment.

PHILLIPS—Big Dome O. & G. Co., 1, ne 1-32n-32e, resum at 2100 ft.

PONDERA—Miller Bros.' Bruins 1, nw 17-28-1w, rig up.

STILLWATER—J. S. Stewart, 5-2n-22e, show consid gas at 2300 ft.

SWEETGRASS—Shoshone Consolidated, 1, 23-2n-15e, dr 4060 ft, report 3000 ft oil in hole.

TETON—Texas Pacific's Halcro 1, 12-22-1w, to abdn 1263 ft. Ohio Oil Co.'s Coghill 1, 32-26-2w, spd.

TOOLE—Sunburst O. & R. Co.'s Sunburst 1, nw 10-34-3e, rig up. Monalta Oil Co., Ltd.'s Buckley 1, se 1-37-4w, dr 500 ft. B. & B. Oil Co.'s Dunkirk 1, nw 20-31-1e, will resume, td 600 ft.

NORTH LOUISIANA

Completions

CADDO PARISH—
D. C. R. Oil Co., Hunter Estate 1, 17-19-14 . . . . . 130 2422

BIENVILLE PARISH—W. G. Gray Tr's Snyder 1, 15-16-6w, rig up.

BOSSIER PARISH—Nell & Lanier's Biedenharn 1, 23-21-14, sd 790 ft. Big Ben Oil Co.'s Stewart 1, 15-18-12, sd wo 1300 ft. Walker et al's Antrim 1, 28-22-13, set 6⅝-in cas at 2740 ft, set 5 3/16 cas 2970 ft, bailed dry show oil no gas arr deepen, td 3017 ft. John F. Woodman's Bolinger 1, 9-22-11, tested sw sd wo 3100 ft. Magnolia Pet. Co.'s B. M. Cook 1, 2-22-11, r to bottom 3111 ft. Triangle Drilling Co.'s J. H. Fullilove 1, 11-17-12, rig up.

CADDO PARISH—D. C. R. Oil Co.'s Hunter Est. 1, 17-19-14, 12 ft sand flowing 130 bbls oil daily by heads, td 2422 ft. J. O. A. Carper's Hammock 2, 34-18-16, temp abn, td 920 ft. Lide & Davidson's Glassell 1, 1-19-15, dr 895 ft. Root Refineries' Leibman 1, 12-19-15, dr 900 ft.

CATAHOULA PARISH—Lochnager O. & G. Co.'s Taliaferro 1, 26-9-6e, sd 900 ft.

DESOTO PARISH—P. J. Becker's Tull 1, 23-12-15, did not skid over to new hole as planned, cmtd bottom old hole arr sdtr slip, td 1361 ft. Carlton Drilling Co.'s Stephens 2, 12-11-16, sd wo 2046 ft. Thorn Oil Co.'s Burford 1, 22-14-14, sd wo 3020 ft. Longstreet Synd.'s Ramsey 1, 33-13-16, fsh cas, td 2802 ft.

FRANKLIN PARISH—Ruston Drilling Co.'s West Va. Timber 1, 23-15-7e, rig up. Davis et al's Moore 1, 12-11-6e, sd 1430 ft.

GRANT PARISH—Carter & Collins' Ball Lbr. Co. 1, 29-7-1w, abn, td 2410 ft. Hardtner's Tannehill 1, 9-6-1w, dr 2538 ft.

JACKSON PARISH—Geo. O. Baird's Tremont Lbr. Co. 1, 24-17-1w, rig up.

LINCOLN PARISH—V. E. Shaw et al's Voss 1, 1-20-3w, tested dry d.s. test arr deepen, td 2732 ft.

MOREHOUSE PARISH—Woodley & Collins' Harp 1, 22-22-7e, r to bottom, td 3006 ft. Rainbow Oil Co.'s Louisville Cooperage 1, 33-22-8e, drk.

NATCHITOCHES PARISH—S. D. McDaniel's Clarje-Morse Lbr. Co. 2, 23-5-6w, tested sw show gas est 1 mil cu ft 8 ft sand, sd wo 2536 ft. Robeline O. & G. Co.'s Cassady 1, 1-8-9w, tested dry show gas, sd repr rig 3086 ft.

OUACHITA PARISH—Ouachita Nat. Gas Co.'s D'Arbonne B-2, 25-19-2e, sd 3349 ft. Phillips et al's School Fee 1, 16-16-4e, arr set 6-in cas 3600 ft.

RAPIDES PARISH—G. E. Silbertson's Willemach 3, 13-5n-4w, sd wo 2250 ft. Glenmora Pet. Co.'s Fee 1, 1-2n-2w, sd 3850 ft.

RICHLAND PARISH—S. C. Wilson's Buie 1, 17-15-7e, sd 1946 ft.

SABINE PARISH—W. J. Garnier's Bowman-Hicks 1, 16-7-12, sd 625 ft. R. L. Gay Tr's Bowman-Hicks 2, 14-7-14r, dr 3512 ft; Bowman-Hicks 3, 14-7-14, cemt 6-in cas 2090 ft, tested dry with show oil at 2144 ft arr retest 2164 ft. Long-Bell Lbr. Co. 1, 26-8-14, dr 328 ft. Sabine Lbr Co. 1, 13-7-14, temp abn, td 2936 ft. A. H. Tarver's Long-Bell Lbr. Co. 1, 29-8-13, dr 1044 ft.

TENSAS PARISH—Enochs et al's Curry 1, 39-11-12e, plugged back to 3522 ft to shut off sw, td 3583 ft.

UNION PARISH—Texas Co.'s F. M. Fuller 1, 9-21-2w, rig up. Sunby et al's Security Trust 1, 6-23-1e, sd wo 2300 ft. G. E. Carmatte's Tugwell 2, 21-22-1e, arr set 6-in cas, td 1931 ft. Carter & Wingfield's Clark A-3, 8-23-1e, dk. H. C. McDonald's Union Sawmill 2, 18-23-1e, sd 1500 ft.

WEBSTER PARISH—P. Hudson's Slack 1, 1-22-11, sdtr ds 2460 ft, td 2592 ft. Nemours Corp.'s Munn 2, 1-22-10, tested 4 mil cu ft gas wo 2633 ft. Magnolia Pet. Co.'s Atkins 1, 4-22-9, fsg 2653 ft. John F. Woodman's Boyd 1, 3-22-11, drk. Magnolia Pet. Co.'s Denman 1, 1-22-11, cleaning to bottom, td 2716 ft.

EAST TEXAS

BOWIE COUNTY—Hooks O. & G. Co.'s Rosenberg 1, King sur, temp abn, td 3086 ft.

CAMP COUNTY—Rogers et al's Enfelt 1, Montgomery sur, sd 1920 ft.

RED RIVER COUNTY—D. M. Buffington's Hoosier 1, Hughart sur, dr 1625 ft. Shad Harper's Garland 1, Jos. Wagley sur, sd wo 1862 ft. Johnson Pet. Co.'s Randolph 2, Dean sur, sd wo 1440 ft.

SHELBY COUNTY—Chapparral Oil Co.'s Holt 2, Matthew Moore sur, sd 3004 ft. Gulf Ref. Co.'s Caraway 1, Patterson sur, coring blue shale streaks grey and brown lime 4193 ft.

ARKANSAS

Completions

CHICOT COUNTY—
W. S. Smith, Meyer 1, 19-19-2..... * 850
Joe Crawford, Cashion 1, 14-18-2.... * 2330

ASHLEY COUNTY—Atlantic O. P. Co.'s Bledsoe 1, 20-15-7, dr sand rock 2760 ft.

BRADLEY COUNTY—Ohio Oil Co.'s Sou. Lbr. Co. 2, 19-16-9, coring 3257 ft. Phillips Pet. Co. et al's J. W. Kline 1, 28-16-12, lcn.

CALHOUN COUNTY—Phillips Pet. Co. et al's Eagle Mills Lbr. Co. 1, 11-16-12, lcn.

CLARK COUNTY—Wm. Henry Tr's Clark 1, 34-9-21, sd 1385 ft.

CRAWFORD COUNTY—Industrial O. & G. Co.'s Brownlee 2, 22-9-31, lcn.

COLUMBIA COUNTY—G. W. Dawley et al's Fullenwider & Kitchen 1, 12-17-22, sd wo 2847 ft. Helena O. & G. Co.'s Pickler 1, 19-19-22, dr 2510 ft.

CHICOT COUNTY—W. S. Smith's Meyer 1, 19-19-2, will not drill hole abn dry, td 850 ft. Joe Crawford's Cashion 1, 14-18-2, dry abn no cas set, td 2330 ft.

DALLAS COUNTY—Robt. H. Dedman's Hillman 1, 20-10-13, temp abn, td 1145 ft.

DREW COUNTY—McClintock & Goedke's Ogle 1, 35-13-5, old well trying to clean, td 2530 ft. Ohio Oil Co.'s Jerome Lbr. Co. 1, 13-15-4, top Nacatoch sand 3152 ft, dr 3447 ft.

FAULKNER COUNTY—Gold Creek O. & G. Co.'s Stermer 1, 17-4-13, temp abn, td 3462 ft.

FRANKLIN COUNTY—Ozark Nat. Gas Co.'s McElroy 1, 15-8-27, lcn.

GARLAND COUNTY—H. H. Given's Garrett 1, 1-3-19w, sd 2988 ft. Chaywood Oil Co.'s Malvern Lbr. Co. 1, 17-2-17, fsh bailer, td 1668 ft.

GRANT COUNTY—Jones & Watkins' Meek 1, 5-4-11, sd 1400 ft.

JOHNSON COUNTY—Ark. Nat Gas Corp.'s Bynum 2, 12-10-24, set 8-in cas 2503 ft, cleaning out at 2503 ft; McPherson 1, 10-10-24, pulled 7-in cas 3360 ft fsh tools 3455 ft.

LITTLE RIVER COUNTY—Grote et al's Allen 1, 21-12-13w, sd 2941 ft.

LOGAN COUNTY—Ark. La. Pipe Line Co.'s Hanna 1, 26-7-23, dr 1525 ft. Ark. Nat. Gas Corp.'s W. H. Parks 1, 26-8-24, pulling cas to abn, td 4600 ft.

OUACHITA COUNTY—Chas. McDonald's Wilson B-2, 25-15-18, mudding up hole to abn, td 2906 ft. Magnolia Pet. Co.'s C. M. & K. Wilson 1, 25-15-18, tested dry, ds test 2866-73 ft in red beds repr rig, td 2917 ft. Ref.'s Wilson 1, 25-15-18, cored br sand showing some oil and blue shale 2863-69 ft, plugged back to 2845 ft cemt on cas setting had previously swabbed oil and 1800 ft, sw 2863 ft. Flaucher et al's Bucks 1, 7-15-17, sd 2475 ft. Cumberland Pet. Co.'s Burton 1, 24-15-18, dr hard rock 2775 ft. Timberlake et al's Wright 1, 25-14-18, dr 2170 ft. Geo. Kouri et al's Henson 1, 24-15-18, lcn. Ark. Drilling Co.'s Crowley 1, 27-15-18, rig up, (formerly L. L. McDonald et al's Crowley 1).

ST. FRANCIS COUNTY—W. F. Harris' Halbert 1, 32-4-4, lcn.

UNION COUNTY—Sundby et al's Yocum 1, 29-16-17, dr 3310 ft. Hawthorne O. & G. Co.'s Smith 1, 8-16-17, dr 3002 ft. La. Oil Ref. Corp.'s Manley 1, 15-15-19, dr 4112 ft. Wesson et al's Booth 1, 12-15-19, sd wo 2180 ft. Foster et al's Murphy Land Co. 1, 22-17-17, sd 1400 ft. J. O. Moore, Tr's Union Sawmill 1, 11-18-12, sd 2890 ft. J. P. Hawkins et al's Goodwin 1, 36-17-16, drk. Grimes Bros.' Hill 2, 7-18-14, 10-in cas 185 ft, dr 1000 ft. J. C. Marcum's DeYambert 1, 5-19-4, temp abn, td 3312 ft. W. M. Coates, Tr's McDuffie 1, 32-19-16, sd 142 ft. J. W. Olvey's Cottrell 1, 22-19-17, tested sw ds test 3342-53 ft, dr 3412 ft. Gulf Ref. Co.'s 1, Rosa L. Cook 1, 1-18-15, 3336 ft; Gaddy 2, 30-17-14, coring red shale 3134 ft.

KANSAS

BARBER COUNTY—Barbara Oil Co.'s Angel 1, c nw ne 14-33-13w, rig. Roland's et al's Pickens 1, ne nw ne, 27-30-14w, d 4515 ft. Allison & Fitzwilliams' Morrise 1, c nw se se, 9-30-12w, d 2250 ft.

BUTLER COUNTY—Smith & Ash's Donnelly 1, nec 8-24-6e, sd 2215 ft. Phillips & Shell's McClellan 1, se sw 23-26-6, d 2885 ft. LaRobb et al's Bronsenger 1, ne se 24-27-3e, ru. Shell's Thiesstein 1, c se sw se 10-24-3e, d 1760 ft.

CLAY COUNTY—Derby & Snow Bros' McNeil 1, c sw nw 15-9-4e, d 400 ft.

COWLEY COUNTY—Wakefield & Osborne's Osborne 1, nw ne 18-30-3e, shot 4 qts 2847-80 30 bbls. J. B. Markey's Tatum 1, se sw 11-31-6e, sd 500 ft.

DICKINSON COUNTY—T. C. Johnson's Detweiler 1, swc ne nw 32-16-4e, d 1870 ft.

EDWARDS COUNTY — Amerada-Wilcox's Tensil 1, nw cor 32-25-19w, sd 5000 ft.

ELLIS COUNTY—Rush Oil Co.'s Gatewood 1, nw 4-15-20s, d 1600 ft. Finney & Weimer's Freeman 1, nw se se 24-15-20w, spd and sd. Brown's Gestner 1, nw se nw, 13-13-18w, sd 1350 ft. Burger et al's Hadley 1, c sw sw nw 20-11-17w, spd and sd. Brouck's Wagner 1, c se se 35-15-16w, ur 6-in 3438 ft. Phillips' Schmeidler 1, nw cor 20-12-17w, sd subd 108 bbls 8 hrs. T. C. Johnson's Robbins 1, sw nw 15-14-16w, td 1040 ru. Phillips' Johnson 1, sw ne 9-13-19w, d 2880 ft. Phillips' Dechant 1, ne se 12-13-16w, d 2650 ft.

GREENWOOD COUNTY—P. H. Balieu's Bright 1, ne sw 22-27-12e, hfw 1981, td 2900 d and a.

GEARY COUNTY—Wright et al's Younkers 1, nwc ne 17-11-5e, d 2000 ft.

GRAHAM COUNTY—Gulf Coast's Johnson 1, swc sw se 27-8-15w, sd 2450 ft.

HARPER COUNTY—Amerada's Mendiville 1, c se se 24-34-6w, d 4890 ft.

HARVEY COUNTY—Margaret Gay Oil Co.'s Grouse 1, nw ne nw 29-33-1w, sd 2100 ft. Helmerick & Payne, Lindamood 1, c sw ne sw 2-22-1e, sd 3375 ft. Empire's Tangeman 1, c sw ne ne 19-22-1e, d 3490 ft. Hartman & Skaer's Seaman 1, cnw ne se 26-24-1e, d 2895 ft. Roth & Fauret's Rombrowsky 1, nwc 26-22-1e, sd 700 ft. Jolly & Ogg's Randall 1, nec 11-24-1w, ur 8-in cas. Patton et al's Buning 1, cse sw ne 18-24-1e, sd 2000 ft. Jolly & Oggs' Hupp 1, se ne 22-23-1w, d 1550 ft. Fisher & Lauck's Reiger 1, nw ne 17-23-2e, fsg 2958 ft. Rosenthal et al's Ingalls 1, c nw sw 24-33-3w, sd 1360 ft. Slick & Connell Oil's Gatz 1, nw se 30-22-1e, d 1420 ft. Gypsy & Blankenship's Roebeck 1, c sw nw 27-24-4w, rog. Independent & Reserve's Moulds 1, c ne 7-24-1w, spd and sd. McCulloch's Prouty 1, nw sw 3-23-1w, rig.

JACKSON COUNTY—Garvin & Morton's Lutes 1, sw nw nw 27-7-15e, sd 2496 ft.

JEFFERSON COUNTY—Wichita Oil Co.'s Simpson 1, nw sw sw 19-10-17e, ru and sd.

KIOWA COUNTY—Wilcox O. & G. Co.'s Woodward 1, nec 35-27-17w, d 1481 ft.

LANE COUNTY—Blankenship Pet. Co.'s

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1030 DW-3 API-3
1240 DW-4 API-4

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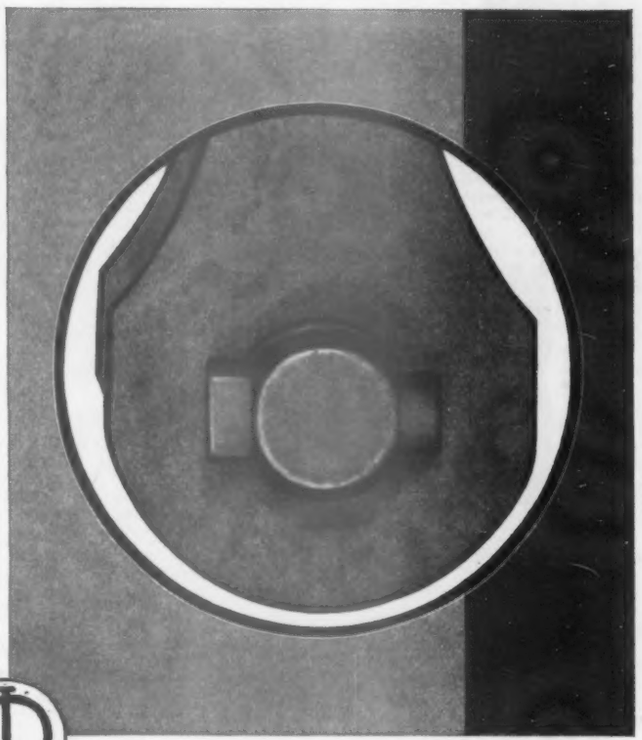
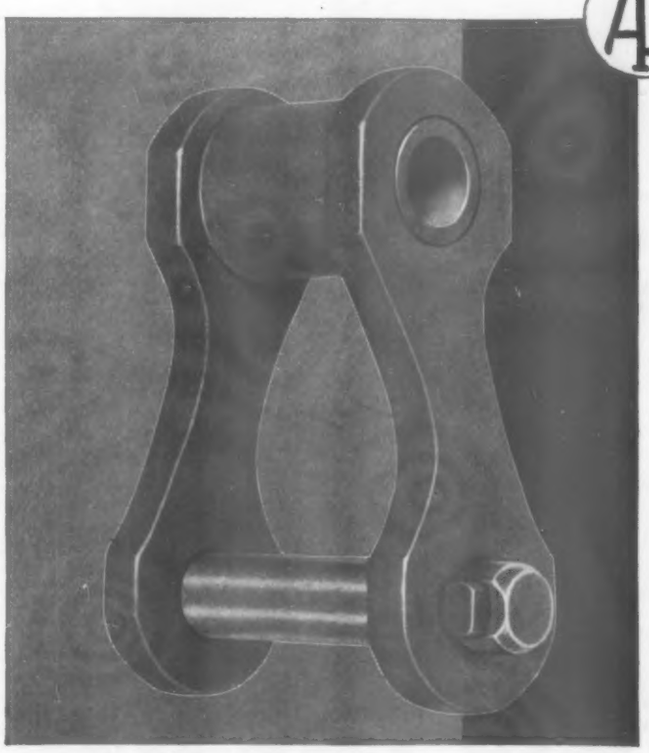


The New, Rex Solid Cotter



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Shaeffer 1, nec ne 24-16-28w, spd and sd. Robinson et al's Dickerson 1, swc nw se 11-12-27w, 8-in at 11-18-27w.

MARION COUNTY — Connell & Prairie's Zirak 1, se sw 3-18-3e, sd 2250 ft. Meyer's Papp 1, sw ne 10-18-2e, sd 2755 ft. Hartman & Skaer & White Eagle's Kline 1, ne nw 28-12-3e, d 2430 ft. General Utilities' Propp 1, c ne se sw 18-19-4e, rig. Hanna's Pankratz 1, ne ne sw 13-20-3e, rig. General Utilities' Burkholder 1, csl n½ se 8-19-3e, d 2115 ft. Moore et al's Miller 1, nec 26-19-1e, d 1775 ft. Empire's Scully, c sw ne ne 28-19-2e, d 1225 ft.

MARSHALL COUNTY—Irwin et al's Cooper 1, ne nw 10-3-7e, d 1320 ft.

MORRIS COUNTY—Hiatt et al's Blythe 1, wn ne 35-15-5e, d 1750 ft.

McPHERSON COUNTY—McPherson County Gas Co.'s Rasmussen 1, swc 8-18-3w, spd and sd. Ted Washabaugh's Vosshell 1, ne ne 9-21-3w, ur 6-in csg 3002 show. Mid Kansas' Yoder 1, c nw sw 8-20-4w, td 4000 d and a. Helmerich & Payne's Rusen 1, c ne se sw 23-21-2w, d 1375 ft. Tatlock et al's Meyer 1, e sw sw ne 32-20-1w, d 1125 ft. McPherson's Reitz 1, nw se sw 1-20-2w, sd 1350 ft.

NESS COUNTY—Barnsdall's Lauck 1, c sw 35-18-21w, d 3900 ft.

OTTAWA COUNTY—Anderson et al's Bank 1, ne nw 29-10-2w, sd 3610 ft.

OSBORNE COUNTY—Trees' Payenter 1, c ne se se 22-6-15w, sd 650 ft. Jarvis' Jellison 1, sec 13-10-15w, sd 3059 ft. Empire's Crest 1, se ne 30-9-14w, sd 3200 ft.

PAWNEE COUNTY—F. C. Troupe's Lovett 1, cel ne ne 31-21-16w, sd 1560 ft.

PRATT COUNTY—Jones & O'Haver's Lunt 1, csw nw 15-28-14w, d 840 ft.

PHILLIPS COUNTY—Watsonian Oil Co.'s Marklein 1, ne sw 21-3-19w, d 3965 ft. Watsonian & British American's Weiman 1, c sw sw 34-2-19w, sd 1847 ft.

RENO COUNTY—Perry et al's Oswald 1, ne ne se 30-22-5w, d 2400 ft. Austin Drlg. Co.'s Strickey 1, swc nw 12-26-5w, d 2115 ft.

RICE COUNTY—Allison & Fitzwilliams' Poland 1, ne sw ne 36-19-8w, collar. Higgins & Steinbuble's Shurr 1, ne sw 21-20-10w, ur 10-in cas 1900 ft.

RILEY COUNTY—Grey et al's Smith 1, ne se 30-6-6e, d 275 ft.

ROOKS COUNTY—Krueger et al's Steis 1, c nw se sw 12-9-16w, spd and sd. Burford & Primm's Tora 1, ne sw se 22-9-17w, spd and sd. Prairie's Gick 1, c se 22-9-18w, d 3135 ft.

RUSH COUNTY—Danciger O. & G. Co.'s Pinoka 1, c ne sw ne 17-19-17w, d 2595 ft. Central Commercial's Brock 1, nec sw sw 12-17-16w, spd and sd. Phillips' Legleiter 1, c ne nw se 10-16-18w, 2400 ft oih fsg 3573 ft. Barnsdall's Brock 1, c se se 21-17-17w, d 985 ft. Danciger's Swindt 1, c sw se sw 22-17-17w, d 945 ft. Wilcox O. & G. Co.'s Schwartz Roph 1, c ne nw sw 27-17-17w, d 1950 ft.

RUSSELL COUNTY—Prairie-Slick's Sellans 1, sw ne 36-15-13w, d 1460 ft. Phillips' Solback 1, se nw 32-12-14w, ru.

SALINE COUNTY—M. Esty et al's Peterson 1, c ne 6-16-5w, spd and sd. Nathan-Jones et al's Robertson 1, nw sw 27-14-2w, shot 6 qts 3315-46 no show. Kenning Coastal Co.'s Beal 1, c 23-14-5w, d 2400 ft. Boyle et al's Miller 1, swc se 21-16-1w, sd 2615 ft.

SEDGWICK COUNTY—Magnolia's Wise 1, nwc 36-22-1w, set 6-inch csg 3030 ft. Producers Oil Co.'s Jones 1, c sw ne se 31-26-2e, dr 2670 ft. Hawkins' Murfie 1, c sw 4-25-1w, dr 950 ft. Hartman & Skaer & Carter's Hitchinson 1, c se se sw 23-28-2w, dr 3135 ft. Morgan & Tilley's Fitzgerald 1, nw ne 5-26-1w, sd 800 ft. Slick's Rosenhagen 1, c sw se ne 33-27-4w, dr 2260 ft. Blankenship & Washoma's Tuttle 1, sw nw 1-27-1e, dr 2570 ft. Connell Oil Co.'s Cross 1, ne cor 27-25-1w, pumping 12 bbls. Kroder et al's Harden 1, sw nw sw 20-26-1e, sd 1100 ft. Morgan et al's Corn 1, sw ne 28-25-1w, sd 3300 ft. Jones & Kirk's Sheppard 1, c se ne 4-25-1e, sd 3082 ft. Kyser et al's Street 1, sw nw 28-26-1w, sd 3800 ft. Lario & Blair's Tjaden 1, c ne se 22-29-2w, dr ur lugs, td 3090 ft. Maglason's Buckles 1, nw se 3-28-1w, sd 250 ft. Ramsey's Schuesaler 1, 1-25-1e, td 3503 ft, dry and abn. Miller & Wentz's Shaeffer 1, nw ne 9-27-2w, set 10-inch at 2095 ft. Lewis et al's Taylor 1, nw ne 23-27-2e, dr 3116 ft. Shawver et al's Reeves 1, c se sw ne 19-28-1e, average 285 bbls. Washabaugh's Harrison 1, c nw ne ne 3-26-2w, sd 350 ft. Hammond & Stout's Roeder 1, sw nw 23-27-2w, spudded. Johnson & Marshall's Roy 1, c ne se sw 23-29-1w, rog. Connell & Slick's Mahennah 1, e ne se se 3-25-1w, dr 2120 ft. Empire's Henderson 1, swc 35-25-4w, dr 1270 ft. Sullivan et al's Shelly 1, c nw ne se 32-29-2e, dr 2880 ft. Shawnee Oil Co.'s Newman 1, c se sw nw 5-26-1e, spudded. Reynolds & Rogers' Updegraft 1, c se sw se 26-25-1w, rig. Twist et al's Armstrong 1, ne nw 28-26-1e, spudded and sd. Patton & Wentz's Swanson 1, nw ne 8-26-2e, ur 8-inch 2555 ft. Twist et al's Joseph 1, 4-25-1w, dr 1495 ft. Tatlock et al's Cook 1, swc 25-28-2e, dr 2775 ft. LaFont et al's Carlton Bros. 1, c se se sw 24-28-1e, sd 870 ft. Frank Wehn's Wilson 1, c ne nw se 9-26-1w, rig and tools. Shell's Lygrisee 1, se ne 15-26-2e, 750 bbls 3163-66 ft. Shawver et al's Scott 1, c se sw sw, 10-28-1e, ru. White Eagle's Robbins 1, se se 20-28-1e, rog. Burnett's Davidson 1, c nw nw sw 27-26-1e, spudded and sd.

SHERMAN COUNTY—A. L. Henson et al's Murray 1, ne se nw 22-7-40w, sd 3035 ft.

SMITH COUNTY—Mid-Kansas's Lambert 1, nec 4-2s13w, fsh 3485 ft.

STEPHENS COUNTY—W. Sidwell et al's Kelly 1, sw ne 16-34-38w, sd 1310 ft. Trees Oil Co.'s Goudy 1, sw ne sw 3-35-38w, dr 500 ft.

SUMNER COUNTY—Gypsy's Williams 1, nw se sw 16-35-3w, average 373 bbls pinched in. Davidson et al's Strickland 1, sw se 12-35-1w, rig. Marland's Curry 1, nw sw 26-34-2e, sd 2500 ft.

TREGO COUNTY—Central Commercial Oil Co.'s Ellis 1, ne sw ne 20-13-21w, sd 3895 ft.

WASHINGTON COUNTY—McCool & Vicent's Linn 1, nw ne 27-4-3e, ru.

TEXAS GULF COAST

Completions

FALLS COUNTY—
Humble, Piper 1 ..... * 1640

WASHINGTON COUNTY—
Davis et al, Seward 1, ½ mi n Independence ..... * 2510

AUSTIN COUNTY—F. & M. Drlg. Co.'s Mewis 1, w of Raccoon Bend and e of Bellville, cored sand at 3180 ft. Whittington et al's Lass 1, 4 mi nw Bellville, dk.

BRAZORIA COUNTY—Humphreys Corp.'s Bryan 1, Bryan Heights, dr 2727 ft. Meyer et al's Davidson 3, Clemens Dome, bailed salt and sulphur water at 925 ft. Empire's Brock 3, Stratton Ridge, set surface casing at 630 ft.

CALHOUN COUNTY—Baker & Thompson's Thomas 1, 9 mi w Pt. Lavaca, depth 2730 ft.

CHAMBERS COUNTY — Pure's Mayes 2, Lost Lake, dr 1286 ft; Mayes 3, Lost Lake, dr 1340 ft.

COLORADO COUNTY — The Texas Co.'s Kinkler 1, Cat Springs, prep to abn. Shell's Frazier 1, Bernardo, dr 972 ft sand. Merrett et al's Zverck 1, 2 mi e Ellinger, sd 320 ft. Humble's McGraw 1, Altair, dr 350 ft sand.

FAYETTE COUNTY—Moore et al's Kerr 1, Muldoon, sd 2078 ft. National Oil Co.'s Melcher 1, Plum, dr 3350 ft shale.

FORT BEND COUNTY—Gulf's Wolf 15, Long Point, dr 585 ft sand. Humble's Miller 1, 3½ mi sw Rosenberg, moving in rig. South Texas Pet. Co.'s Winkelman 1, Needville, dr 750 ft gbo.

GOLIAD COUNTY—Humble's Rietz 1, 5 mi n Goliad, dr 675 ft sand.

HARDIN COUNTY—Guedry Drilling Co.'s Guedry 1, 3 mi s Batson, dk. Gulf Coastal Oil Co.'s Nona Mills 1, 5 mi e Saratoga, sd 1725 ft. West Prod. Co.'s Baker 1, 5 mi e Saratoga, dr 4285 ft sand and shale.

HARRIS COUNTY—Humble's Simms-Smith 75, Goose Creek, dr 4420 ft shale; Warren 5, Hockley, r 4271 ft; Irvin 1, Mykawa, dr 3605 ft sand and shale; Woodburn 1, 2 mi s Genoa, ru. Paxton et al's Brubacker 1, 1 mi ne Clodine, sd 1125 ft. Paxton & Pundt's Brown 1, dr 1541 ft lime and shale. Little York Oil Co.'s Davis 1, Little York, sd 3100 ft. York & Robertson's Garrett 1, 5 mi se Fauna, lcn.

JACKSON CONUTY — The Texas Co.'s Moore 1, Edna, dr 3802 ft sand. Wright Bros.' Drushell 8, Edna, dk; Classen 2, Edna, sd 3945 ft.

JEFFERSON COUNTY — Deep Test Oil Corp.'s McFaddin 1, 1 mi e Spindle Top, sd 3500 ft. J. W. Farhar et al's Rohwedder 1, 5 mi ne Beaumont, sd 2965 ft. Beaumont Oil Co.'s Tyrrell 1, 2 mi w Brooks, dk. River Oil Co.'s Ship Channel Ld. Co. 1, 2 mi se Beaumont, sd 1320 ft. Bleakie Oil Co.'s Tolliver 1, 2½ mi nw Voth, sd 1750 ft. The Texas Co.'s Pipkin 1, Big Hill, drilled plug, washing, depth 5900 ft. Gulf's Thomas 11, Fannett, dr 4860 ft sticky shale; Bordages A-7, Fannett, dr 5150 ft; Bordages A-6, Fannett, dr 5300 ft. Yount-Lee Oil Co.'s Nona Mills 1, 5 mi s Beaumont, dr 6150 ft shale. Shell's Heisig 1, 2 mi n Hampshire, dr 2511 ft gbo.

LIBERTY COUNTY—Barlow et al's Hinchcliff 1, 2½ mi ne Cleveland, sd 2215 ft. Kouri et al's Campbell 1, 6 mi s Cleveland, sd 2000 ft. The Texas Co.'s Davis 2, Davis Hill, dr 4242 ft sand rock. Humble's Sterling 4, Moss Bluff, dr 3544 ft salt. Union Exploration Co.'s Esperson 2, 5 mi w S. Liberty, prep to bail at 5797 ft. Tan Bay Oil Co.'s Christian 1, 10 mi n Hardin, sd 1115 ft. Republic Prod. Co.'s Mysilvic 1, 2 mi s Hardin, dr 2250 ft gbo. Gulf's Boyt 1, Hankamer, ru. Fort Bend Oil Co.'s Bladerack 1, N. Dayton, dr 2470 ft gbo. Sun's Kovaleik 2, N. Dayton, dr 3600 ft water sand.

MATAGORDA COUNTY—Crossland et al's Hawkins 1, Shepherds Mott, dr 4872 ft sand and shale. Dr. P. S. Griffith's Culver 1, e Citrus Grove, sd 3215 ft. Baer 1, 1½ mi n Gulf Hill, sd 2120 ft.

ORANGE COUNTY — Veteran Oil Co.'s Reed 1, 2 mi se Orange field, sd 3175 ft. The Texas Co.'s Kuhn 1, 4 mi e Spindle Top, depth 3160 ft.

VICTORIA COUNTY—Humble's Welder 1, 3 mi se Nursery, dr 180 ft.

WALLER COUNTY—Dixie O. & G. Co.'s Brazos River State 1, sd 500 ft. The Texas Co.'s Young 1, 3 mi from Raccoon Bend, dr 3020 ft.

WASHINGTON COUNTY—Thomas et al's Giddings 1, 4 mi e Brenham, dr 570 ft. W. D. Anderson's Rubinstein 1, 4 mi se Gay Hill, sd 340 ft. Brains et al's L. S. Smith 1, 4½ mi ne Gay Hill, ru. Dekle et al's Calhoun 1, 4 mi e Quarry, dr 45 ft clay. Kellett et al's Carter 1, sd 900 ft.

WHARTON COUNTY — Hearte Oil Co.'s Brown 1, 3 mi s El Campo, sd 2243 ft.

SOUTHWEST TEXAS

Completions

CALDWELL COUNTY—
Harper et al, Miller 1, 4 mi w Lytton Springs ..... * 1780

GUADALUPE COUNTY—
Magnolia, Whiley 1, 6 mi e Kingsbury ..... * 3325

JIM HOGG COUNTY—
The Texas Co.'s Vela 2, sur 582... * 2450

WEBB COUNTY—
The Texas Co., Weeks-Wilder 2, Sec. 683 ..... ¶10 2602

BASTROP COUNTY — Gypsy Prod. Co.'s Lottman 1, e Bastrop, sd 2150 ft. Livingston et al's McCall 1, 1 mi s Bastrop, dr 2600 ft shale. Owens et al's Goodman 1, 1½ mi Cedar Creek, dr 2327 ft shale. Howell et al's Weckham 1, 2 mi s Paige, spudded. Gulf's Bell 1, 2½ mi w Sayersville, dk.

CALDWELL COUNTY — Anderson et al's Horner 1, 1 mi s Lockhart, 1400 ft. United North & South's Gideon 1, Luling field deep test, dr lime 4540 ft. United-Gulf's Blundell 1, 6 mi se Lockhart, dr 1547 ft, sticky shale.

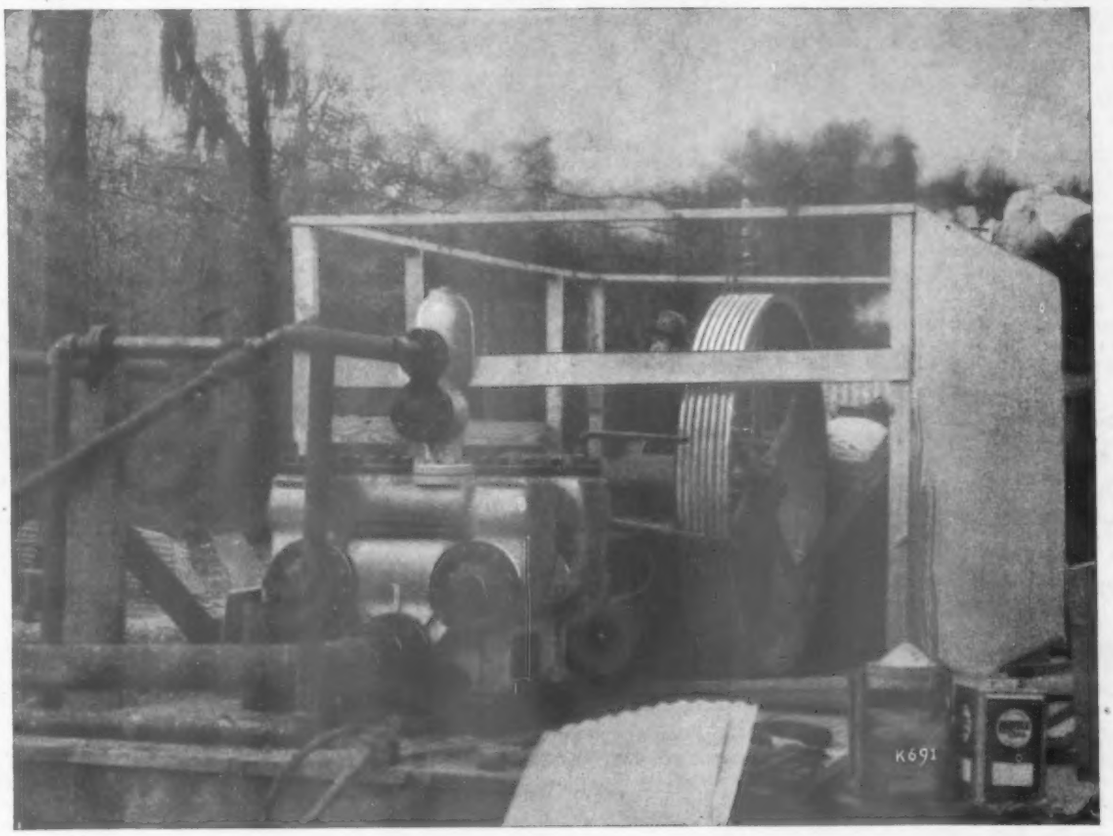
GONZALES COUNTY—Greene et al's Dix 1, 1 mi n Bellmont, sd 1235 ft. Linderman Bros.' Frampton 1, 1 mi n Waelder, sd 610 ft. Benedum & Trees' Lamkin 1, 1 mi n Ottine, dr 4305 ft lime. Flynn et al's Wilhouser 1, 12 mi e Gonzales, sd 5212 ft. Empire's Norwood 2, Ottine area, dr 4165 ft shale. Joe Bruner's Miller 1, 1 mi n Waelder, sd 2150 ft. Crown Pet. Co.'s Hattenbach 1, 8 mi sw Sample, sd 1525 ft.

GUADALUPE COUNTY — Christie et al's Thomas 1, 12 mi se Seguin, sd 2180 ft. Sights et al's Woehler 1, 4 mi e Seguin, sd 2405 ft. Miller Bros.' Springs 1, 5 mi s Seguin, sd 2550 ft. Magnolia's Adams 1, Kingsbury, ru.

MAVERICK COUNTY—Rycade Oil Corp.'s Chittim 3, 20 mi e Eagle Pass, dr 3612 ft; Chittim 4, 20 mi e Eagle Pass, dr 1852 ft lime and shale; Sullivan 4, 20 mi e Eagle Pass, dr 1325 ft.

STARR COUNTY—The Texas Co.'s Virginia Guerra 1, dr sandy shale at 2686 ft.

Continuous Service



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WEST TEXAS

Completions

Company, Well and Location	Initial Production Bbls.	Depth
ANDREWS COUNTY—		
Deep Rock Oil Co., Hostetter 1....	*	4604
GAINES COUNTY—		
Pure Oil Co., Williamson 1	†	4124
GLASSCOCK COUNTY—		
The California Co., W. R. Settles 1	*	3417
HOWARD COUNTY—		
L. C. Harrison et al, Dodge 1	*	3257
JONES COUNTY—		
McSigler Co., Martin 1	*	2018
UPTON COUNTY—		
Sun Oil Co., Long 1	*	2216

ANDREWS COUNTY — Mid-Continent Pet. Corp.'s Fisher 1, elev 3192 ft, ur 1480 ft.

BORDEN COUNTY—Gibson-Johnson et al's Higginbotham 1, elev 2432 ft, top salt 1135 ft, top lime 2870 ft, dr 2995 ft. Greene O&R Co.'s Slaughter 1, elev 2521 ft, top salt 1222 ft, top lime 3040 ft, showing water, dr 3255 ft. C. E. Hyde et al's Beal 1, elev 2361 ft, top salt 1105 ft, top lime 2752 ft, dr hfw 339 5ft. W. A. Moncrief et al's Munger 1, lcn. Teas & Wheeler's Long 1, lcn.

BREWSTER COUNTY — Ed. W. Bateman & Co.'s Neville 1, elev 3950 ft, show oil, dr 1973 ft. Brewster Oil Co.'s Fee 1, dr 1550 ft. E. L. Chapman et al's Skinner 2, machine. J. P. Johnson & Bert Weekly's Jackson-Harmon 1, elev, 3972 ftñ fsh 1045 ft.

COKE COUNTY—W. C. Cates & J. S. Dennis' Mims 1, sd 1655 ft; Mims 2, spudded and sd. Mid-Kansas O&G Co.'s Lackey 1, elev 2152 ft, show oil 3755-56 ft, sd in water sand 3785 ft. Ray McCamey et al's McCutchen 1, dr 685 ft.

CONCHO COUNTY—J. L. Duffey et al's Gilliam 1, spudded and sd. Jones & Liner's Jones 1, fsh 1100 ft.

CRANE COUNTY—Gulf Prod. Co.'s Waddell 7, dr 820 ft.

CROCKETT COUNTY — Barbara Oil Co.'s Cox 1, dd, elev 2051 ft, top lime 1082 ft, dry and abn 2008 ft. W. A. Moncrief-W. W. Donnelly et al's Todd 1, (Sec. 35), elev 2613 ft, plug back from water 1400 ft to shoot pay 1365-81 ft; Massie 1, (Sec. 47), dr 1110 ft. Sonnelly-J. D. Young's Shannon 1, (Sec. 42), elev 2661 ft, sd 780 ft. Eppenauer Drlg. Co. & West Texas Pet. Corp.'s Noelke 1, sd 565 ft. Lewis & Daniels' Pecos River Bed 1, elev 1967 ft, top lime 1002 ft, sd 1008 ft.

CULBERSON COUNTY — Deep Rock Oil Co. & Grisham-Hunter Corp.'s Kloh 1, fsh 1440 ft. Hickey et al's C. O. Finley 1, elev 3916 ft, dr 1910 ft.

JEFF DAVIS COUNTY—Sam F. Means et al's J. Z. Means 1, sd 4005 ft.

FISHER COUNTY—Cranfill & Reynolds et al's Willingham 2, elev 1808 ft, top lime 3071 ft, dr 3410 ft. Culberson Bros. & Mesa Oil Co.'s Griffin 1, elev 1842 ft, sd 2970 ft. J. B. Dunigan et al's Henry 1, elev 1913 ft, sd 3260 ft. Gilman-McMurray & French's Cleveland 1, elev 1973 ft, dr 3185 ft. Landreth Prod. Corp.'s Cooper 1, dd, dr 3505 ft. Magnolia Pet. Co.'s Lee 1, dk. Mid-Kansas O&G Co. & Phillips Pet. Co.'s Stephenson 1, rig. Roeser-Pendleton & Amerada's Haught 1, elev 1792 ft, fsh 1965 ft. Texas Co. & Phillips Pet. Co.'s Hall 1, elev 2102 ft, dr 2950 ft. White Eagle O&R Co.'s Hughes 1, elev 1815 ft, ur 2300 ft.

GARZA COUNTY—Emerald Oil Co.'s Reed 1, spudding.

GLASSCOCK COUNTY—Daniels & Kyle's Meek 1, elev 2792 ft, sd 405 ft. Gibson-Johnson et al's Irene Dean 1, rig. Meriwether Oil Co.'s McDowell 2, elev 2517 ft, top salt 970 ft, top lime 2445 ft, dr 3855 ft. Texas-State Oil Co.'s Edwards 1, dk. World Oil Co.'s L. S. McDowell 1-C, elev 2530 ft, (Sec. 21, Blk. 34), top lime 2260 ft, testing pay 2351-98 ft.

TOM GREEN COUNTY—Williams et al's Wilkey 1, sd hfw 750 ft.

HOWARD COUNTY—Fuhrman Pet. Corp.'s Reed 1, lcn. Gibson-Johnson et al's Reed 1, elev 2323 ft, dr 1610 ft. Harrison et al's Dodge 1, abn after pumping test, td 3257 ft. Peck et al's Scrivner 1, spudding.

HUDSPETH COUNTY — The California Co.'s University 1, elev 5833 ft, crooked hole, td 967 ft. Western States Oil Co.'s Gardner-Mosely 1, elev 5086 ft, sd 3155 ft; Moore 1, elev 5150 ft, sd 2760 ft.

IRION COUNTY — Fuhrman Pet. Corp.'s Sugg 1, Lse. 2, top salt 920 ft, top lime 1808 ft, dr 2380 ft. Irion County Drlg. Co.'s Tankersley 2, ur 995 ft. Kimbrough et al's Nutt 1, elev 2299 ft, sd 1420 ft. W. W. Brown-Kimbrough & Flinchbaugh's Tankersley 1, elev 2241 ft, dr 1245 ft. Kingwood Oil Co.'s Sugg 1, elev 2334 ft, top blue shale 6306 ft, dr shale 6510 ft.

JONES COUNTY—Brewer et al's Goodman School lot 1, lcn. Geo. Callahan & Worth Oil Co.'s Britton 1, ur cas 1300 ft. Campbell et al's King 1, spudded and sd. W. G. Clark et al's Dickenson 1, dr 725 ft; Miller 1, lcn. Condor Pet. Co.'s McDonald 1, dr 2165 ft. Culberson Bros. et al's Anderson 1, lcn. Grisham-Hunter Corp.'s Hester 1, elev 1855 ft, top lime 2532 ft, show oil 2774-2800 ft, dr 2815 ft. P. K. French et al's Leeson 1, sd 215 ft. Sam Knepley et al's Horn 1, dr 650 ft. McGinley-Sigler Co.'s Whittemore 1, dr 1725 ft. Sedgwick O&G Co.'s Routh 1, elev 1730 ft, top lime 2700 ft, dr 3235 ft. E. M. Treat O&G Co.'s Hodges 1, dr 1200 ft, White Eagle O&R Co.'s Teague 1, spudding.

LOVING COUNTY — Lockhart & Co.'s Hazell 1, elev 2705 ft, rig; Hazell 2, dr 335 ft; Johnson 1, dr 735 ft; Hubbard 2, elev 2692 ft, top salt 718 ft, dr 3565 ft; Wheat 1-H, elev 2713 ft, top salt 720 ft, dr 3375 ft.

LYNN COUNTY—Hart Oil Corp. & Geo. McCamey's Edwards 1, elev 3128 ft, dr 1250 ft in red beds. H. F. Miller et al's May 1, spudded and sd.

MENARD COUNTY—J. B. Holstein et al's Davis 1, lcn. Duffey & C. G. Cromwell's Winslow 1, dr 310 ft.

MIDLAND COUNTY—Phillips Pet. Co.'s Stokes 1, dr 1455 ft.

MITCHELL COUNTY — California Co.'s Clark 2, top lime 1540 ft, dr 1925 ft. Clopton & Hammon's McKenzie 1, lcn. Jack Ellis & Atlantic's Ellwood 1, elev 2270 ft, sd 1½ million ft gas 633-47 ft. Republic Prod. Co.'s Scott 1, lcn. Simms Oil Co.'s Ellwood 1, elev 2237 ft, top lime 1215 ft, dr 3270 ft; Ellwood 1-A, dr 1190 ft. Spence et al's W. C. Brown 1, sd 330 ft. Teas & Wheeler's Radford 1, elev 2223 ft, top salt 667 ft, top lime 1365 ft, sd 3965 ft. Westyde Inv. Co.'s Ellwood 1, materials.

NOLAN COUNTY — L. G. Bradstreet & Co.'s Kuteman 1, rig. Phillips Pet. Co.'s Plunkett 1, dr 215 ft.

PECOS COUNTY—Atlantic Oil Prod. Co.'s J. C. Trees 1, dr 520 ft. M. H. Black et al's Pecos 1, top salt 1095 ft, cem cas 1483 ft. Buell-Hagan et al's University 1-B, dr 235 ft. A. R. Bell et al's Gray 1, dr 1095 ft. Carl Cromwell & Kimberlin's Jackson 1, lcn. Ditto Oil Interests' Montgomery 1, lev 4434 ft, dr 1405 ft. Doran & McGee's Pecos 1, fsh 1030 ft. Cowboy Evans et al's Pecos 1, dk. J. W. Grant et al's Turney 1, elev 2592 ft, top lime 1015 ft, sd 4590 ft. Imperial O&G Co. et al's Pecos 1, lcn. Sam Kitts et al's Sherbino 1, fsh 250 ft. Mauch & Krogen's Holmes 1, elev 2325 ft, top salt 535 ft, sd 1442 ft. R. E. Moore et al's Arnold 1, machine. W. A. Moncrief et al's Tippett-Unit Plan 1, rig. J. D. O'Mara et al's Byrne 1, spudded and sd. O. J. Perren et al's H. J. Eaton 1, elev 2497 ft, top salt 1090 ft, sd making 18 million ft gas 1490-1502 ft. Phillips Pet. Co.'s Courtney 1, dr 725 ft. Plymouth Oil Co.'s F. A. Perry 2, rig. Schumaker et al's Williams 1, elev 2388 ft, sd 1004 ft. Shell Pet. Corp.'s University 1, (Sec. 29, Blk. 16), lcn. Shell & Kirby Pet. Co.'s University 1, elev 2628 ft, dr 4505 ft. Ervin Drlg. Co. & B. J. Spikes et al's Brown 1, elev 2387 ft, top salt 740 ft, sd 1100 ft. Talbot et al's Unsicker 1, lcn. Taylor-Link Oil Co.'s University 1, (Sec. 30, Blk. 16), lcn. Tidal Oil Co.'s University 1, dr 135 ft. Transcontinental Oil Co.'s University 1, elev 2552 ft, top lime 1035 ft and 3315 ft, fsh 4312 ft; University 1-B, dr 300 ft; White & Baker 1, elev 2810 ft, dr 840 ft. Trees Oil Co. & Empire Gas & Fuel Co.'s Trees 1, elev 2461 ft, top salt 1760 ft, show oil 2127-33 ft, sd 2216 ft. Bert Weekly et al's Byrne 1, dr 1340 ft. Clayton Williams et al's Sanford 1, machine.

PRESIDIO COUNTY—Brite Prod. Co.'s L. C. Brite 1, sd 900 ft. C. E. Miller-Delmar & Phillips Pet. Co.'s Tootle 1, sd 2470 ft.

REAGAN COUNTY—Kemrow & Co.'s Sawyer 1, lcn. Skelly Oil Co.'s University 4, dr 1280 ft. Big Lake Oil Co.'s University 1-C, elev 2731 ft, top salt 1100 ft, sd 2465 ft; University 2-C, elev 2703 ft, top salt 1071 ft, dr 2150 ft; University 131, dr 5910 ft.

REEVES COUNTY—Penn Oil Co.-Amerada et al's E. G. Bowles 1, elev 2783 ft, top salt 1725 ft, dr 5330 ft. Southern Crude & Dixie Oil Co.'s Kloh 1, elev 2784 ft, dr 1375 ft. D. R. Thompson et al's Eddins 1, elev 2719 ft, top salt 1622 ft, top lime 3216 ft, brown lime 3500 ft, sd 5658 ft. Lee O. White et al's Kloh 1-A, elev 3244 ft, dr 985 ft.

RUNNELS COUNTY—Herbert Oil Co. et al's Currie 1, dr 630 ft. Independent O. & G. Co.'s Rollwitz 1, dr 1920 ft. Marland Prod. Co.'s Herring 1, elev 1821 ft, show oil 3204-10 ft and water 3360 ft, dr 3400 ft. Ira Nourse & E. Tilton's Cramer 1, elev 1775 ft, sd 3815 ft. Reese & Cates' Clayton 1, sd 1185 ft. Vacuum Oil Co.'s McMillan 4, dk.

SCHLEICHER COUNTY—Ft. McKavitt Oil Co.'s Tisdale 1, elev 2155 ft, dr 2615 ft. Interstate Explo. Co.'s Whitten 1, sd 3545 ft. Underwood Oil Co.'s Tisdale 1, spudded and sd.

SCURRY COUNTY—R. B. Pender et al's Davis 1, elev 2208 ft, top salt 445 ft, sd 2600 ft.

STERLING COUNTY — Foster-Gracey Oil Co.'s Foster 1, elev 2260 ft, dr 2445 ft. Miller Bros. et al's Foster 1, elev 2662 ft, top salt 1140 ft, top lime 2094 ft, dr 2955 ft. Wilson et al's Ellwood 1, dr 415 ft.

SUTTON COUNTY—Phillips Pet. Co.'s Holman 1, elev 2247 ft, top lime 2315 ft, dr black lime 6480 ft. L. G. Priest et al's Allison 1, dr 2020 ft. Southern Crude & Dixie Oil Co.'s Allison 1, co after recovering junk, td 4445 ft.

TAYLOR COUNTY—J. B. Jameson et al's Webb 1, sd 2160 ft. Mid-Continent Pet. Corp.'s Taylor 1, elev 1933 ft, co for 2nd shot, td 3007 ft. C. M. Root Drlg. Co.'s Martin 1, dr 1055 ft. Thomson et al's Hamner 1, sd 2615 ft.

TERRELL COUNTY—Milham Corp.'s Bassett 1, elev 2270 ft, sd 4760 ft.

VAL VERDE COUNTY—Dyer Bros. et al's Wilson 1, elev 2115 ft, fsh 2715 ft. Producers Oil Co. et al's Everett 1, sd 2375 ft. Val Vert Oil Corp.'s Bassett 1-A, elev 2069 ft, sd 3760 ft.

WARD COUNTY—Atlantic & Delmar Oil Co.'s Hayzlett 2, rig. Barstow O&G Co.'s Monroe-Gillespie 1, spudded and sd. Gulf Prod. Co.'s O'Brien 5, dr 250 ft; Hutchings 2, dr 210 ft. J-H-L Oil Co.'s Hayzlett 2, elev 2505 ft, top salt 745 ft, set cas 2400 ft. Kimberlin et al's Thompson 1, lcn. J. F. Shipley et al's Monroe 1, lcn. Tex-Oil Prod. Co.'s Redman 1, sd 960 ft.

WINKLER COUNTY—M. J. Bashara et al's Fee 1, (Sec. 17, Blk. B-3), elev 2883 ft, top lime 2310 ft, gas blowout est. 10 million ft daily and burning, td 2481 ft. Liner Drlg Co.'s Campbell 1, spudded an dsd. Magnolia's Scarborough 2, rig. Prairie O&G Co.'s Scarborough 1, elev 2914 ft, fsh and flowing 150 bbls oil daily 2930-3081 ft. Shell & Llano's Scarborough 6, rig. Texas-Canadian Oil Co. & Superior's Kloh 1, elev 3243 ft, top salt 1490 ft, dr 3945 ft. Tidal Oil Co.'s Scarborough 1, dk.

YOAKUM COUNTY—Bert Weekly et al's Knight 1, sd 1105 ft.

SOUTH LOUISIANA

Completions

ST. LANDRY PARISH—		
Elbof Exploration Co., Henry Smith 1, Sec. 14-6s-1e	*	4315
TERREBONNE PARISH—		
The Texas Co., Lake Barre A-1, Sec. 37-21s-19e	*	920

ASCENSION PARISH—Gulf's United Lands Co. 1, Sorrento, dr 1835 ft; Belle Helene Sugar Co. 1, Darrow, dr 5000 ft. Triumph Oil Corp.'s Lacey et al 2, 3 mi se Sorrento townsite, dr 2122 ft gbo. Big Dome Drlg. & Dev. Co. and J. S. Kimbrough's Rearwood 1, Darrow, sd 3000 ft. Baton Rouge Pet. Co.'s Liotta 1, sd 1000 ft. Pickhard & Geisman's Fee 1, moving in material.

CALCASIEU PARISH — The Texas Co.'s Moss 1, dr 1325 ft gbo. J. O. Davis' Mimms 1, Lake Charles, dr 1466 ft gbo.

CAMERON PARISH—The Texas Co.'s Calcasieu Lake A-3, s end of Calcasieu Lake, set surface cas. Pure's Yount-Lee 7, Sweet Lake, dr 5330 ft shale and lime; Yount-Lee 8, Sweet Lake, set cas to test sand at 5632-37 ft. Shell's Watkins 6, Black Bayou, oil show at 4727 ft, will test; Watkins 10, Black Bayou, ru.

IBERIA PARISH — The Texas Co.'s Vermilion Bay A-3, sd 4695 ft. Gulf's State Z-9, Loreauville, ru; Moresi Co. et al 1, Loreauville, dr 3430 ft.

IBERVILLE PARISH — Shell's Wilbert 3,

White Castle, dr 4525 ft shale. Standard of La.'s Wilbert 2, Bayou Blue, set surface cas; Wilbert 3, Bayou Blue, ru; Schwing 1, Bayou Blue, dr 4325 ft gbo; Schwing 2, Bayou Blue, ru; Schwing 3, Bayou Blue, dredged canal; Schwing 4, Bayou Blue, lcn; Schwing 5, Bayou Blue, dk.

JEFFERSON DAVIS PARISH—Vacuum's Earl et al 1, Roanoke, sd 5920 ft; DeVilbiss 1, Roanoke, sd 5685 ft.

LA FOURCHE PARISH—Gulf's Stark 10, Thibodaux, dr 1430 ft cap rock; Stark 11, Thibodaux, dr 1100 ft gbo; Stark 12, Thibodaux, lcn; Stark 13, ru. Union Sulphur Co.'s Dibert, Stark & Brown 3, Thibodaux, sd 3142 ft; Dibert, Stark & Brown 4, Thibodaux, dr 1991 ft; Dibert, Stark & Brown 5, Thibodaux, ru.

PLAQUEMINES PARISH—Gulf's Morris & Rose 1, Spanish Pass, dk. The Texas Co.'s Garden Island Bay 1, 15 mi se Venice, preparing to set cas at 1100 ft.

ST. LANDRY PARISH—The Texas Co.'s Botney Bay Lbr. Co. Fee 2, Port Barre, ru. Gulf's Gaudet 1, Port Barre, ru.

ST. MARTIN PARISH—Ohio Oil Co.'s Martin et al 3, Hager dome, sd 4490 ft. The Texas Co.'s St. Martin Land Co. Fee 1, Hager dome, set surface cas. St. Martin Land Co. Fee 2, Hager Dome, capped piling; St. Martin Land Co. Fee 3, Hager dome, piling standing; St. Martin Land Co. Fee 4, Hager dome, piling standing.

TANGIPAHOA PARISH—Joan Dev. Co.'s Lake Superior Piling Co. 1, nw section 20-5s-9e, depth 1930 ft.

TERREBONNE PARISH—The Texas Co.'s Taylor Bayou B-1, Sec. 28-21s-14e, lcn; Lake Barre A-2, Sec. 30-21s-20e, lcn; Lake Pelto B-1, Sec. 8-23s18e, dk; Four Isle Bayou B-1, Sec. 23-21s-16e, dk; Timbalier Bay A-1, Sec. 19-23s-20e, ru; Bay Coon Road B-1, Sec. 17-22s-18e, bldg dk; Dog Lake Bayou A-1, Sec. 6-22s-16e, dr 885 ft sandy shale.

PERMITS

(Continued from page 90)

KAY COUNTY—DeCamp and Lancer, Eggers 1, c sw, 26-28-1w. Comar, Beverlin 3w, owdd, nw se nw, 34-25-1w.

KINGFISHER COUNTY—Superior Oil Co., Story 1, sec 25-19-5w.

KIOWA COUNTY—Cummings et al, Brough 1, nec se sw 18-6n-16w.

MARSHALL COUNTY—Jordan et al, Penn Mutual Life Co., 1, nw ne se 17-5s-5e.

MUSKOGEE COUNTY—E. Price, Woodall 4, csl sw sw 20-15-16e.

OKFUSKEE COUNTY — F. Moore et al, Autry 1, swc se nw 12-10-11e. Barnsdall, McKinney 1, nwc se 18-10-11e.

OKLAHOMA COUNTY—Texola Oil Co., Spencer 1, nw se nw 22-11-3w.

OKMULGEE COUNTY—E. W. Dodge, Buffalo 1a, nwc se 32-15-12e. A. H. Howard, Doyle 1a, cel w½ se sw 17-13-14e.

OSAGE COUNTY—Peters Pet. Co. et al, 11, nw se nw 17-27-6e. I. T. I. O. Co., 1, swc nw 16-27-10. Peters Pet. and Producers and Refiners Co., 1, sec sw 22-27-11. Peters Pet Co.'s 2, se cnw 28-24-10e. M. Grace Maxwell, 3, nwc ne se sw 5-24-11e. Pueblo Pet. Co. 2, nec se sw 14-21-8.

PAWNEE COUNTY—Prairie O. & G. Co., McNeal 10, sw ne nw 10-20-8e. Peters Adamson, Parker 2, se sw se 24-21-7e, owdd. Miller and Stratman, Martin 1, swc se 26-20-9e. Swift and Rush, nw se nw 35-20-9e.

PONTOTOC COUNTY — Westheimer and Daube, Smith 1, se nw nw 10-4n-7e.

POTTAWATOMIE COUNTY — Prairie, Lynn 1, sw ne nw 20-6-4e; Lynn 2, nw se nw 20-6-4e. Prairie and T. B. Slick, Laster 2, sec ne 19-6-4e. Magnolia, Green 3, sw ne nw 20-8-5; Robbins 4, owdd, sec 15-7-4e. Independent's Harding, owdd, sec nw 18-8-5. Magnolia's Jones 1, sec ne 18-7-4. Warner Quinlan Oil Co.'s Light 1, nec se 18-7-4. Magnolia, Latimer 2, swc nw 17-7-4. Phillips Pet. Co., Martin 1, ne se ne 18-7-4. Pure, Tolen 1, nw sw nw 1-7-4. Independent, Borrows 1, sw nw nw 1-7-4. Simms Oil Co., Conn 1, nw ne ne 30-6-4e. Tom Slick Oil Co., et al, Bledsoe 3, nw sw 20-6-4e; Bledsoe 2, swc nw 20-6-4e. Tom Slick, Welden 2, nwc 20-6-4e. Tom Slick et al, Welden 1, sw nw nw 20-6-4e. Tom Slick and Amerada's Deister 1, nec se 19-6-4e.

SEMINOLE COUNTY—Prairie, Billington 12, nw sw nw 11-8-5. Prairie, Dixon 2, sw se ne 4-8-7e. Mid-Continent, Smith 5, ne sw ne 5-7-7e. Empire O&R Co., Cotcha 2, ne nw ne 27-7-6e. Independent Carpenter 4, sw ne ne 27-7-6e. Empire, Cotcha 4, se nw ne 27-7-6e. Empire, Cotcha 3, nw se ne 27-7-6e. Superior 1, sec ne 11-9-6. Sinclair, Davis 2, sw ne se 7-6-8e. Marland and Sinclair, Perry 2, ne nw sw 18-9-7e. Indian Territory, Fleet 2, sec nw 19-5n-8e. Burke Greis Oil Co., Lucy 4, cel ne se 18-5n-8e. Shell, Holatka 1, sw ne se 7-6-8e. Indian Territory, Fleet 1, nwc se 13-6-7e. Continental, Johnson 2, sw se nw 18-9-7e. Shell and Marland, Herndon 4, ne nw ne 7-8-6e. Carter, C. Slick 2, nwc sw 11-9-6e. Carter, C. Strothers 2, sw se nw 11-9-6e. Carter, Walker 2, sw ne nw 24-7-6e. Sinclair, Davis 3, swc se 7-6-8. Marland and Shaffer, Harris 2, sw se sw 4-7-7e. Independent O&G Co., Davis 5, (Twin), ne sw sw 13-7-6e. Independent, Harris 9, sw se nw 23-7-6e. Gypsy, Cotcha 13, se ne sw 23-7-6e. Independent, Reed 2, nw ne nw 26-7-6e. Gypsy, Cotcha 12, nw ne sw, 23-7-6e. Gypsy, Cotcha 11, sw se sw 23-7-6e.

STEPHENS COUNTY — Hedrick et al, Thompson 1, sec nw 1-1n-8w. American Pipe Line Co.'s Dexter 5, sec nw 34-1s-6w. Lone Eagle Oil Co., Simpson 9, nwc se 34-1s-8w. George Pace et al, Cooper 2, ne se sw 16-2s-7w.

WAGONER COUNTY—Horner et al, Barnett 1a, nwc se 34-18-17e. C. F. Finefield, Willis 1a, nwc ne ne sw 34-18-17e.

New Permit Rule Styles Geology as Development

Washington, D. C.—Bona fide geological surveys carried on under permit are to be considered a sufficient equitable basis for the allowance of any applications pending on March 12, last, or extension of permits, under a recommendation made by the departmental committee recently appointed by the Secretary of the Interior to consider ways of carrying into effect President Hoover's oil conservation policy.

The recommendation of the committee, which has been approved by the Secretary, is as follows:

"We recommend that in all cases where clear and definite evidence is filed showing substantial expenditures for reliable geological surveys upon the lands embraced in oil and gas applications and permits, or groups of applications upon the same structure or where the structure is not clearly defined upon the surface, within an area not exceeding six miles square as provided in existing regulations, that the same be regarded as sufficient equitable basis for the allowance of the applications pending on March 12, 1929, and issuance of permits thereon; or where permits have already issued and requests for extension are timely filed, that it be regarded as sufficient equitable ground for extension of such permits. Geological work may be distinguished from ordinary preliminary expenditures as the latter do not operate for the benefit or enlightenment of the government, whereas geological work supplies information which is to the advantage of and may be used by the government in the classification and disposition of the public lands and their resources. This is to be contingent upon a showing of good faith and of responsible diligence on the part of the applicants, permittees or those claiming through or under them."

Senator Would Restrict Oil Commerce

Washington, D. C.—Acquisition of oil lands by foreign governments or the nationals of any foreign governments which prohibit Americans from acquiring oil interests in their countries, dominions, dependencies, mandatories or spheres of influence would be prohibited under the terms of a bill introduced in the Senate by Senator McKellar of Tennessee.

The bill also provides that oil or oil shale, or the manufactured or refined products thereof, shall not be exported to any foreign government or to the nationals of any foreign government in any case where such foreign government, its dominions, dependencies or mandatories refuse to permit the United States or its nationals to acquire and ship similar products to the United States or otherwise to use the same in foreign commerce, or where American vessels are discriminated against by any foreign government or its nationals in the furnishing of oil or oil facilities or in the acquiring of oil supply stations in the territory of such foreign governments.

The bill is the same as was introduced by Senator McKellar several years ago.

Phillips Earnings

Tulsa. — Phillips Petroleum Company showed an increased earning during the first quarter of 1929 in comparison with the same period of 1928. Net income after all charges including taxes, but before depreciation and depletion, was $3,612,879.00 against $3,105,091.00 in the first quarter of 1928.

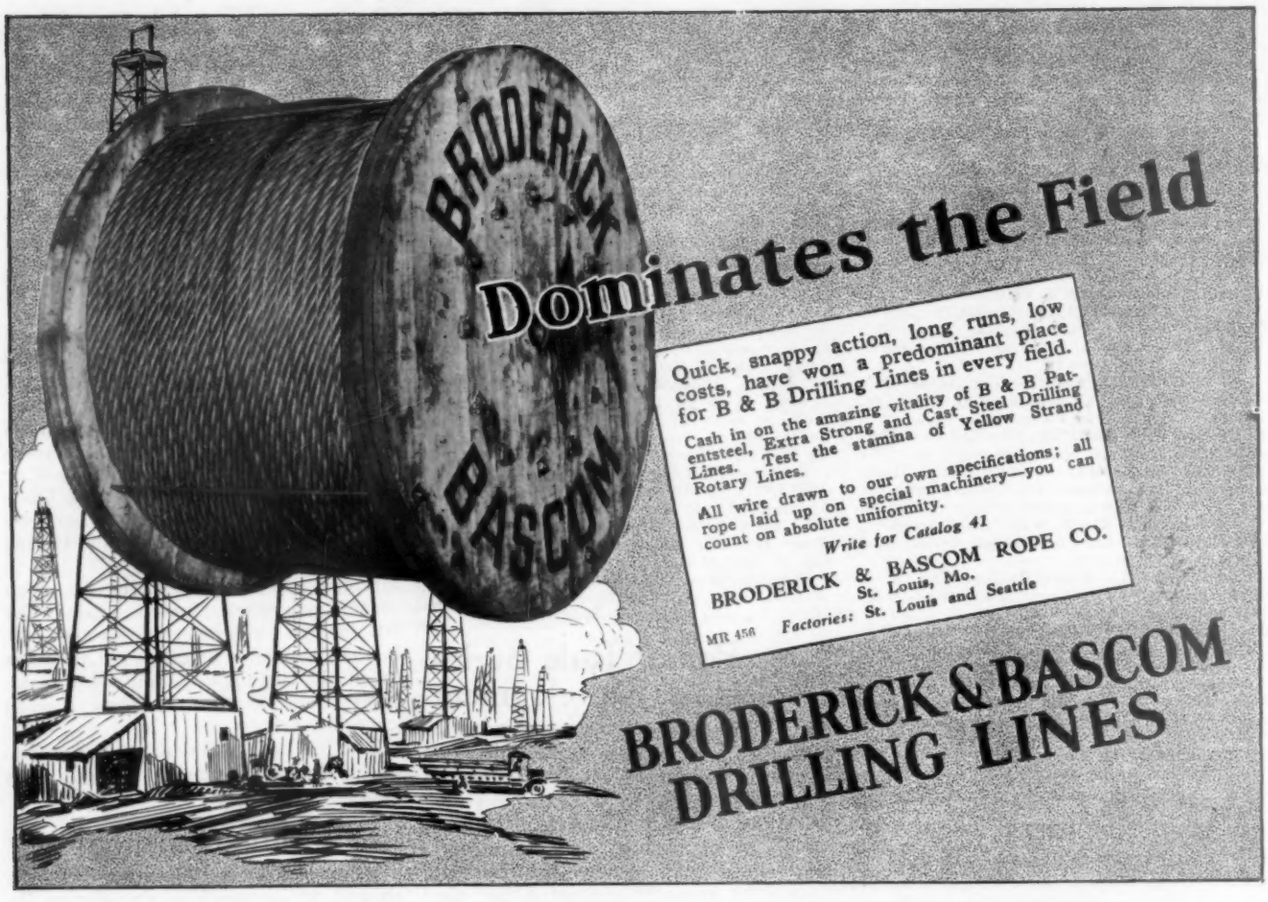
The company now has 48 natural gasoline plants in operation and is building three more. The total natural gasoline production increased more than 20 per cent. over the first quarter of last year, while prices were 16.6 per cent. higher on March 31 than on January 1. The company's marketing division is being expanded. Sales through retail facilities increased 19.8 per cent. in the first quarter of 1929 over the fourth quarter of 1928. Total retail outlets now approximate 2000.

Shipments of domestic and wholesale grades of liquefied petroleum gas increased 395 per cent. over the first quarter in 1928.

Pontotoc Properties Sold

Tulsa.—B. A. and T. E. LaSalle of Ada, Oklahoma, have sold their oil properties in the Beebee field of Pontotoc County to Bennedum & Trees, of Pittsburgh. The consideration was $500,000, of which 60 per cent. is understood to have been in oil and 40 per cent. in cash. The new owners took the LaSalle properties over on May 1.

Approximately 1000 producing and non-producing acres, and 300 barrels daily output was involved.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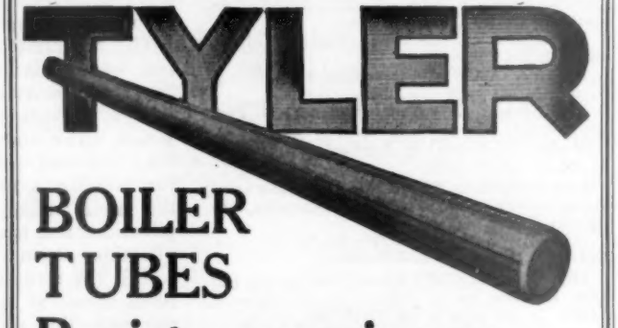

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Lukens Steel Company, New Orleans, La.

Expansion in Long Pipe Lines

(*Continued from page* 23)

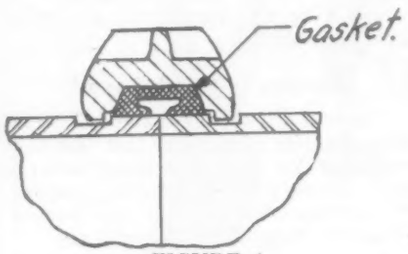

FIGURE 4

pands again to its original length, this latter method is normally a proper one; but it should not be considered invariably the correct procedure. If a line were to be laid in winter, at a pipe temperature which might easily be lower than the minimum earth temperature at the depth of the ditch, then the line should be laid as straight as possible, with provision for expansion instead of contraction.

The desired amount of slack can be easily determined from Figure 1 or from the expansion equation given in the second paragraph, once the probable temperature drop of the pipe has been determined. The equation shows that 1000 feet of steel pipe contract about 8¼ inches for a temperature drop of 100° F, or at the rate of about three feet eight inches per mile. But how to be certain of getting the desired amount of slack into the line is a much more difficult problem to solve.

Slack Calculations

The specification of one field superintendent "Put in all the slack the ditch will hold" sounds generous, but it is highly indefinite and may at best be insufficient to prevent serious stresses in the pipe metal. It is indefinite because the width and depth of the ditches are not standardized, and because the minimum radius to which the pipe can be bent in forming slack arches will vary with the pipe diameter and with the method of fastening the joints together. Presumably, a butt-welded line will be more flexible than one made up with screwed couplings. Moreover, to compute accurately the number of arches needed to supply a given amount of slack, one must know the true shape of these arches; and who can furnish that data? These curves might be approximately acres of a circle, or sections of a catenary, or even sections of a polygon.

The assumption that they are arcs of a circle has this advantage: it allows the claculation of the amount of slack in one arch with the aid of simple mathematics. In the absence of data on the minimum radius to which the pipe and couplings under consideration can be bent, this data could be secured by experiment by preparing such arches as are shown in Figure 3. After measuring the distances H and C, the radius R can be found from the equation $C = 2\sqrt{H(2R-H)}$. The angle A can be computed from the relation: $\text{Sin } A = \frac{C}{2R}$; and S, the center-line length of pipe in one arch, is given by the equation $S = \frac{2\pi R\ 2A^\circ}{360^\circ} = 0.03491\ RA^\circ$. The slack furnished by one arch is S—C.

Use of Formulae

Solving a numerical problem at this point will serve two purposes. It will demonstrate the use of the above formulas, and it will afford some idea of how much slack is provided by these arches. Note that these calculations must always be done by arithmetical "long-hand" methods, *the slide-rule is too inaccurate*. Trigonometric tables carried at least to five places are also required.

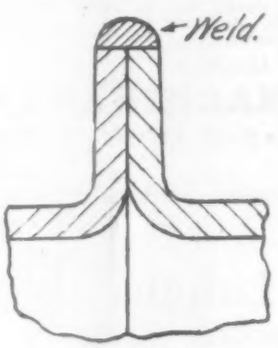

FIGURE 5

Assume that the distance C is 250 feet and distance H is three feet. These values make R equal 2,605 feet, and Sin A becomes 0.0480, making A equal 2.754°. In turn, these values of A and R make S equal 250.23 feet, which is 2.80 inches greater than C. If we assume a 100° drop in pipe temperature between the temperature when the pipe is laid and the minimum temperature it experiences when buried, the contraction will be about 2.07 inches, leaving a small excess slack provided in the line. If the distance C could be decreased to 125 feet (or about six lengths of 20-foot pipe) with H remaining at three feet, the amount of slack provided by the two arches required for 250 feet of ditch would increase to a total of 4.82 inches, or more than double the two inches for a 100° temperature drop. Providing three arches in 250 feet of ditch, with H remaining at three feet, provides 9.54 inches of slack.

Providing for Slack

To secure an arch with a distance H as great as three feet would require placing the arches vertically in the ditch. An objection to this practice is the likelihood that if the earth around the pipe is loose (as it must be if the line is to straighten out), fluctuations in pipe temperature and the resulting expansions and contractions in the pipe length will cause loose earth to collect under the pipe, eventually working it up out of the ditch to the surface. Cases of this sort are said to have actually occurred. They suggest also that if the line is to stay covered, the dips in the line due to rough country should not be counted on too strongly to furnish slack.

To prevent this condition of pipe exposure developing, the pipe may be laid on the bottom of the ditch and arched from wall to wall. If these arches are assumed again to be arcs of circles and if H can be made eight inches when C is 60 feet, R becomes 674.6 fee, A becomes 2.5475°, and S—C becomes 1.08 inches, giving 4.5 inches of slack in 250 feet of ditch. One objection to this method is the extra width of ditch required throughout many miles of line. In any case, when

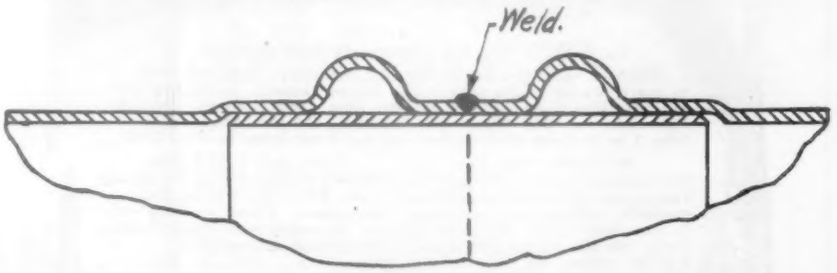

FIGURE 6

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arches are relied on for slack, care must be taken to prevent the pipe from creeping forward and straightening itself out before being covered, thus losing slack before the temperature drop sets in.

Note that the results of the above calculations are applicable in practice only so far as the assumptions on which they are based will fit actual field conditions.

Penaltes of "Slack Loops"

To sum up the "slack loop" situation: in spite of the fact that this construction has been for many years a main reliance in diminishing contraction stresses, it forces the pipe line engineer to face these difficulties:

1. Uncertainty as to the real number and size of arches needed to give a desired amount of slack;

2. Practical difficulties in getting into the ditch enough arches or large enough values of H to provide sufficient slack;

3. Possible trouble in getting the field gangs to follow recommendations based on calculations, even when these are made logically and accurately. Slack has been supplied "by eye" for many years, and a foreman's habits are not always easily changed.

Evidently, the situation would be improved in certainty and definiteness by the use of reliable and inexpensive expansion joints of a kind whose degree of flexibility could be predicted with more confidence than the action of slack loops. Expansion joints, however, force the consideration of such matters as their cost, life, strength under all sorts of stresses, and tightness under pressures of perhaps 800 pounds per square inch, in addition to their reliability and effectiveness as temperatures stress preventers. One must also remember that since welded, screwed, and coupled pipe are all in common use today, the expansion joint must suit the type of fastening preferred.

Flexible Joints

One type of coupling which is claimed to provide both the ability to expand and to allow pipe deflection is illustrated in Figure 4. Its manufacturer allows ⅛" play per coupling, which is almost exactly the contraction for a 100° temperature drop in a 20-foot length of steel pipe. If the pipe is laid hot, with care to have the ends of the pipe butted together, the coupling itself should provide liberally for contraction on cooling, without the need for other slack.

If welded joints incorporating flexibility could be developed, they would possess the advantage of not requiring so much attention during laying of the line to insure the coupling being prepared for future pipe contraction. A type of welded flanged joint providing considerable flexibility is shown in section in Figure 5. Tests reported by

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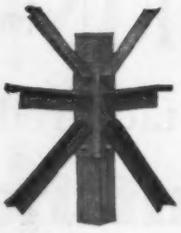

Outside joint of a Washington Derrick. The slot formed by the two plates holds the legs in place, while bolting up, thus making fast erection easy.

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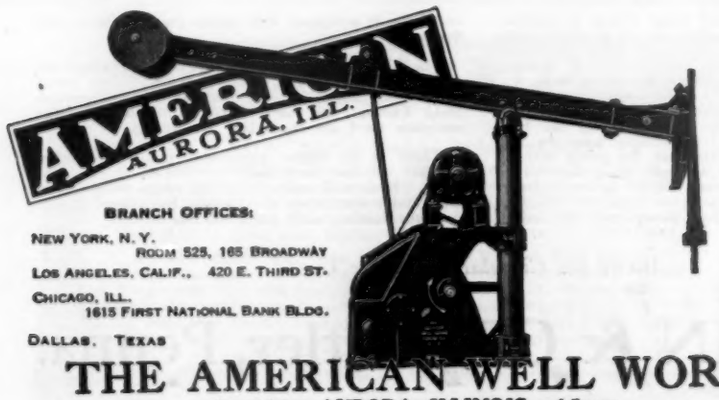

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General Offices AURORA, ILLINOIS *and Factory*

Professor L. T. Jones, University of California, have shown it to be capable of providing for an elongation of more than a quarter of an inch per joint without leakage, or double the amount required for the contraction of a 20-foot length of steel pipe during a 100° temperature drop.

A second type of welded joint providing for considerable expansion or contraction with no need to worry over its adjustment is shown in Figure 6, which probably needs no explanation. Since the corrugations which furnish flexibility are formed at the pipe mill, it is called by the makers an Integral Expansion Joint. The weld should be quite as strong as the ordinary butt pipe weld, and the interior sleeve has the advantages of aiding in lining up the joints, of protecting the weld from flexure, and of preventing the formation of "icicles" of melted welding rod inside the joint. Both ends of the pipe are alike, and they require no special protection during handling.

Installations of this type of pipe have been made recently by at least one oil company to the extent of about 70 miles of line. At least one gas company in the southwest has also used it. Since it promises to take so much uncertainty out of the contraction problem, news of the service performance of this attractive development will be of much interest to pipe line engineers.

Methods of Covering Pipe to Prevent Corrosion
(Continued from page 26)

solvent which must evaporate after application in order that the coating may set. In so doing, the coating is left porous. Another is that it takes longer to dry.

On the other hand, the application of a hot paint on a cold surface has a tendency to destroy the bond, and in ordinary field practice no attempt is made to heat the pipe just prior to the application of the hot paint.

While there is considerable difference of opinion as to the relative merits of hot and cold application, I am favorable to the use of materials that can be applied cold.

Where ordinary protection is desired, that is, where soil conditions are known to be not severe, a covering consisting of a priming coat and one additional heavier coat is usually satisfactory.

Where soil conditions are known to be bad, and the greatest degree of protection is desired, a covering consisting of a priming coat with several additional heavier coats reinforced by wrapping between coats or over the final coat may be necessary.

When more than one coat is applied, it is necessary to allow each coat to dry before the next coat is applied.

I do not believe that any wrapping material such as is now used has any material value within itself as a protective against corrosion. The primary

Dependable Power for Every Purpose

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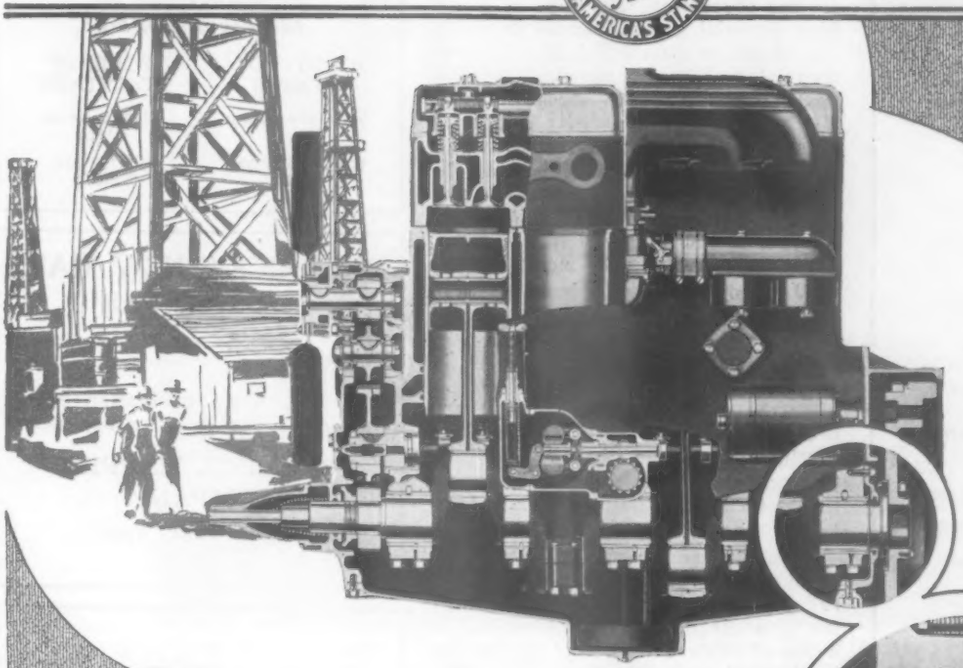
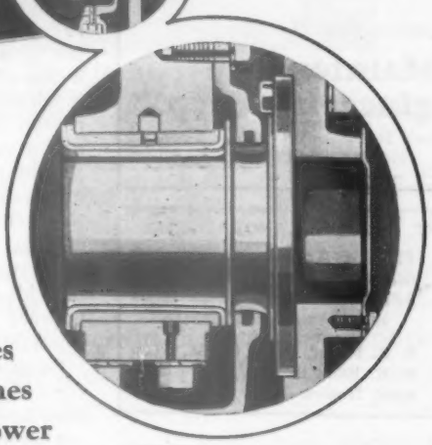


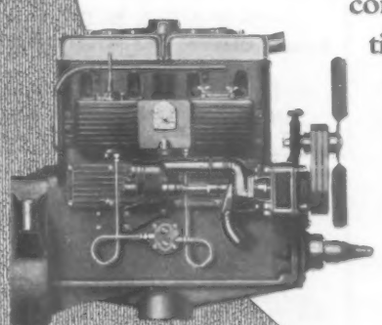


Constant Power on the Dot

Over the broad, far-reaching stretches of the oil fields Continental Engines will furnish that constant power which keeps production going at full tilt, just when most needed.

For pumping, lighting and on air compressions Continental construction insures the great factor of safety as well as outstanding economy in continuous daily operations.

Interchangeability of main bearings is a Continental feature of particular value to users.



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INDUSTRIAL EQUIPMENT DIVISION
Office and Factory: Muskegon, Michigan
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Field Gas Testing. Analysis of oil field brines, gas minerals and oil. Sell Thermometers, Hydrometers and Laboratory Glassware.

F. B. Porter, B. S., Ch. E., Pres.
R. H. Fash, B. S., Vice-President
828½ Monroe St Ft. Worth, Tex.

NOTICE!

The Terrebonne Parish School Board invites bids for the mineral rights on 32 school sections of approximately 640 acres each. These sections are located in Terrebonne Parish (County), Louisiana.

All bids must cover all of the said 32 sections, must be addressed to the undersigned at Houma, Louisiana, and must reach him not later than at 10 o'clock on the morning of May 18, 1929.

A. R. VIGUERIE, *President*
Terrebonne Parish School Board

object of the wrapping is to reinforce the coating and to afford added protection to the coating against abrasion or other injury.

The wrapping material should be thoroughly saturated so as to prevent further absorption. The type of wrapping material generally used is a saturated felt or a saturated fabric. I prefer the loosely woven saturated fabric—approximately 20 inch—because it is less apt to form air pockets because it presents a better surface for bonding between coast, and because it can be more readily applied by hand. The use of a loosely woven saturated fabric wrapper is less apt to permit sagging of the coating under the wrapper.

Obviously, any applied covering cannot be expected to give perfect results if the covering is not maintained permanently intact, and for this reason it is desirable to apply the final coating after the pipe line construction has been completed to the extent that the pipeline is ready to be lowered into the trench, in order to avoid injury to the protective covering as much as possible during construction.

With the use of coal tar or asphalt products, it is necessary to apply a so-called "wrapped job" in order to secure the greatest degree of protection. A wrapped job can be better applied by machine than by hand, and for this reason it may not always be practical nor economical to apply the wrapped job in the field after the line is laid on skids and ready to be lowered into the trench.

I am not in favor of applying a finished wrapped protective covering on individual joints of pipe at the pipe mill because of possible injury to the covering in transportation to the job.

Until suitable machines are available for wrapping pipe in the field along the pipe line, it may be desirable and advantageous to establish central field plants near the construction, where machine wrapping can be done, rather than resort to hand wrapping along the line. These are matters that must be decided on best judgment in the light of conditions existing on each job.

Tulsa.—The oil and gas lease sale held by the Five Civilized Tribes on May 1 was the largest yet to take place in the tribes' offices at Muskogee.

A total of 181 tracts were auctioned of which 124 tracts sold for a bonus of $49,227. Miscellaneous leases for volcanic ash and gold amounted to 46.97 acres and brought a total price of $263.94. Coal leases totaling 167.13 acres brought a bonus of $277.47 and Indian fee lands sold totaled 246.92 acres, bringing $20,466.

TEXAS SAND & GRAVEL CO., Inc.
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SERVING ALL THE TEXAS FIELDS

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Contracts taken for Seismograph Work

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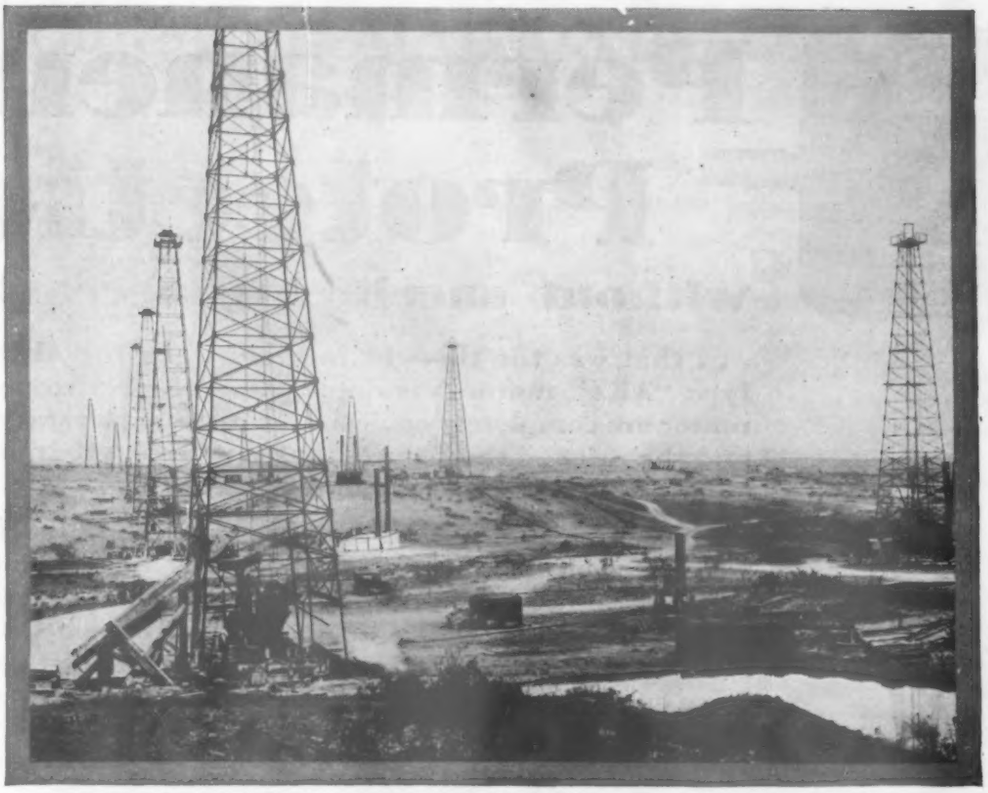
HIRSCH, BROWN AND SUSMAN
Attorneys at Law
Bankers Mortgage Building,
Houston, Texas
Specializing in Oil Law and Land Law



A view of a part of the Grossback Crossing Pool, Electra, Texas (property of The Texas Company) where "INCOR" Brand Perfected High-Early-Strength Portland Cement is used for oil-well cementing and construction work.

SPEED *that has a* MONEY VALUE

FOR difficult oil-well cementing jobs, where speed has a real money value, leading oil men use "INCOR" Brand Perfected High-Early-Strength *Portland* Cement to solve the time problem. With "INCOR" you can resume drilling operations in 24 hours!

Similar savings are obtained in all other oil-field construction work where time is a factor. In many of the largest fields "INCOR" is used exclusively for bottom hole work, for cementing off water and gases, for plugging non-producing holes, for filling crevasses, and for quick construction of derrick corners, foundation beds, etc. "INCOR" contains no admixtures—requires no special methods of handling—mixes readily without lumping—and is actually less expensive to use than ordinary Portland Cement and an accelerator! Write for copies of reports that show how "INCOR" will save time and money for YOU.

INTERNATIONAL SYSTEM
LONE STAR CEMENT
PERFECTED HIGH-EARLY-STRENGTH
"INCOR"
REG. U.S. PAT. OFF.
PORTLAND CEMENT

Outstanding quality and a policy of fair business dealing have earned nation-wide recognition for LONE STAR Cement. Now, to meet the need for dependable 24-hour concrete, the makers of LONE STAR also offer "INCOR" Brand.

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One of the world's largest cement producers—13 mills...total annual capacity 20,000,000 barrels

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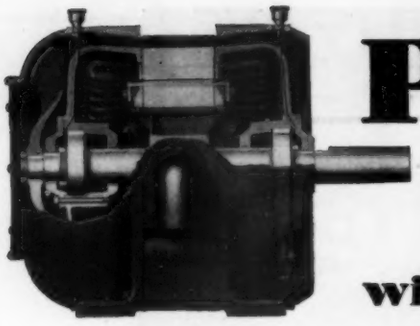
URUGUAY PORTLAND CEMENT COMPANY
Montevideo, Uruguay

Say you saw it in The OIL WEEKLY



Permanent Protection

without sacrificing accessibility

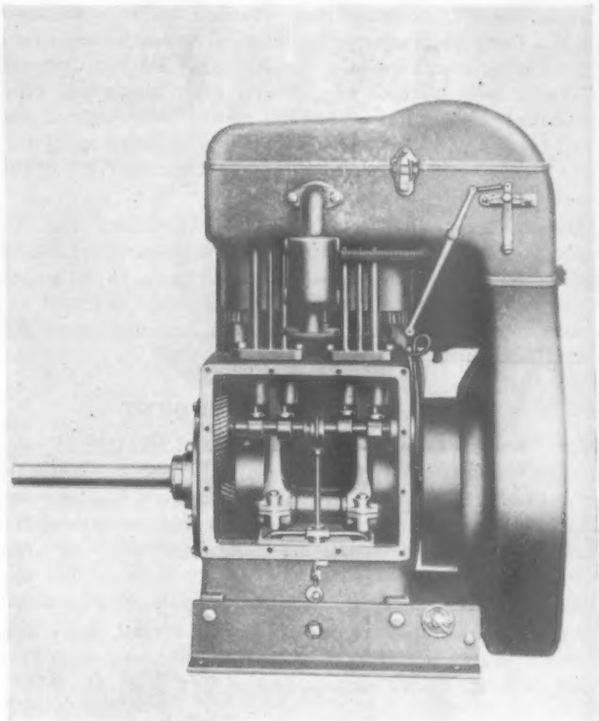
. . . that was the thought in mind when the Allis-Chalmers type "ARZ" motor was developed. The active parts of this motor are completely enclosed, protecting the stator windings and the rotor — those parts that are subject to injury — from sulphurous gasses, acids, alkalis, dust, etc.

End closures and bearing supports, including lubricating devices, are combined into single castings and make this motor as accessible as the conventional open type. There are no rubbing or revolving seals. Cooling air is furnished by a single fan keyed and locked on a short shaft extension opposite the drive end. The mounting space of this enclosed motor is the same as the open type in most ratings.

LEAFLET 2109 tells about these and other standard Allis-Chalmers features. . . . *Write for a copy.*

ALLIS-CHALMERS MANUFACTURING COMPANY ▲ MILWAUKEE

NEW EQUIPMENT, CATALOGS, BULLETINS, BOOKS



Air Cooled Twin Engine

Air-Cooled Twin Engine

NEW-WAY MOTOR COMPANY

An air-cooled engine has been made available through the New-Way Motor Company, Lansing, Michigan, for oil field use, to be featured especially in places where the water problem is difficult or where extreme hot or cold temperatures are experienced. Another outstanding feature offered by the new twin-cylinder air-cooled motor is its light weight, the feature which has made this type of power popular in the aircraft industry.

The New-Way Motor Company's twin engine is a valve-in-head type with detachable cylinder head. A large inspection plate may be removed, according to the manufacturers, exposing all moving parts. This last feature makes possible the removing of pistons through the inspection plate opening with ease.

Included in the standard equipment on this new engine are roller bearings, air-governor, Eisemann special flywheel magneto, Tillotson float feed carburetor and air cleaner, and Lynite connecting rods.

The system of cooling is the same as that employed by all New-Way Motor Company air-cooled engines. The flywheel is provided with a series of curved blower blades around its periphery so that it creates a partial vacuum in the wheel housing as it turns. A current of air is drawn in and down through the cylinder jackets and passes over and between the flanges at fairly high velocity. The disposition of the heat is aided by the large amount of exposed surface and the absorption of heat by the cool air passing around the cylinders and being ejected from the motor compartment by the action of the blower flywheel.

Automatic Blowout Preventer

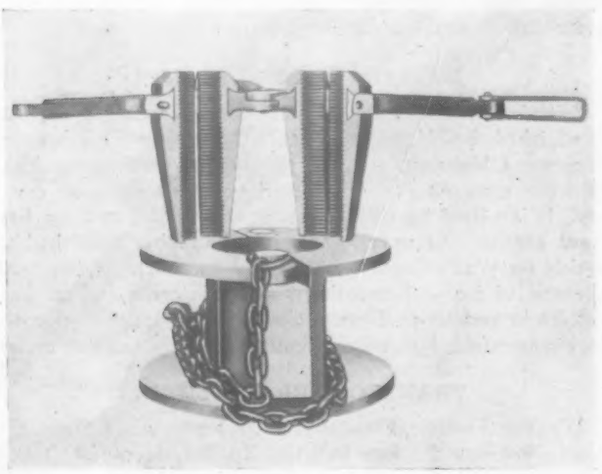
BAASH-ROSS TOOL COMPANY

The Baash-Ross Tool Company, Los Angeles, is now marketing its new Baash-Ross (Hosmer) blow-out preventer with the auto-lock hinged and latched packing assembly featuring safety on drilling wells in territory where high gas pressures are a constant menace.

When the gas alarm is sounded the automatic hinged and latched packing assembly is swung into position, automatically latching itself on the drill pipe. When dropped into the packing the automatic locking packing assembly again automatically latches itself in the lip ring—these two quick motions saving time.

The features of this new device are accomplished with auto-lock packing assembly by means of spring positioned rings, which are made a part of the assembly and, in operation, automatically hook under the lip ring lip. To insure space for these rings, four studs are put in the lip ring to prevent it being screwed on the body too far. After the assembly has been applied, the studs may be removed and the assembly compressed by screwing the lip ring.

This new blow-out preventer is described with illustrations on a loose-leaf page published for insertion in Bash-Ross general catalog following page 42. This page, 42-a, may be had by writing the company, P. O. Box 1110, Los Angeles.



W-K-M Tubing Slip and Spider

Tubing Slip and Spider

W-K-M COMPANY, INC.

To obviate any possibility of swaging long strings of tubing while they are being pulled or run in the hole, and to provide a slip which would hold long strings of hard steel upset tubing, W-K-M Company, Houston, has perfected and is now manufacturing the W-K-M Deepwell tubing slip and spider.

The new tool is based on the design of the W-K-M regular tubing slip and spider.

The Deepwell tubing slips are heavily and substantially made of the finest obtainable steels. All teeth are machine cut to close accuracy, and all segments are heat treated by a special process. Deepwell tubing slip spiders are heavily proportioned, and are designed to sit on top of all types and

sizes of casing heads, being tied down by special chains provided with each spider. If desired, spiders can be furnished with grooved bosses on the bottom side, which permits their being locked in place by the cap screws with which most types of casing heads are equipped.

Full data and specifications will cheerfully be furnished upon application to the W-K-M Company, or to any of the company's district field representatives.

SULLIVAN BOOKLET

The Sullivan Machinery Company has just published a new booklet, No. 83-L, entitled "Sullivan Angle Compound Air Compressors Direct Connected to Diesel Engines." In this booklet is found many illustrations of Diesel engine compressor plants, which have been intsalled in all parts of the country for many different kinds of service, both mining, construction and industrial.

This booklet is 8½x11 inches, 20 pages, printed in two colors. Sizes of stock units are given, and there is also listed the Sullivan four-cylinder "V" type single acting compressors, which are shown direct connected to oil engines. Copies of the new bulletin will be sent gratis, upon request to the company, 400 North Michigan Avenue, Chicago.

DALLAS BRANCH

Russell Manufacturing Company, Middletown, Connecticut, has recently established a branch factory and warehouse at 2208 Commerce Street, Dallas. A complete stock of Rusco products will be carried to give customers in the territory more prompt and efficient service. This stock will include brake linings for trucks, tractors, and industrial brake linings for hoists, belting and power transmission, Durak mounded brakeshoe liners, clutch facings and complete clutch plate replacement parts.

HALLIBURTON BULLETIN

"THE CEMENTER" is inter-company bulletin recently established by Halliburton Oil Cementing Company of Duncan, Oklahoma, for the purpose of exchanging ideas between cementing crews in various fields over the country. It is edited by C. P. Parsons at Duncan, and the first issue carries four pages. This initial number published an article on Water-Cement Ratios and an article dealing with the use of ice in cementing California wells, where heat results in serious problems. Considerable space is devoted in enumerating interesting cement jobs by various crews.

TRANSFORMER BULLETIN

Wagner Electric Company, 6400 Plymouth Avenue, St. Louis, has issued a new bulletin, No. 164, devoted to transformer performance. It is a 12-page bulletin describing the method of making tests on transformers to determine their acceptability and the calculations of operating characteristics from the test data. A copy will be mailed upon request to the company at the above address.

WILSON DISTRIBUTORS

Wilson Supply Company, with stores at Houston, Beaumont and Luling, Texas, has announced that it now is exclusive distributor in the Gulf Coast for Mudwate and SetFast, which products are manufactured by the Shreveport Chemical Company, Shreveport, Louisiana.

Mudwate is a heavy drilling mud of approximately 400 per cent. greater specific gravity than average slush. This quality, along with its other advantages, enables the operator using Mudwate to keep high gas pressures under control while drilling.

SetFast is a chemical which is added to cement to hasten the set, increase the density and make the cement practically waterproof.

LONG OPENS WAREHOUSE

John R. Long of Fort Worth has resigned as manager of the Mid-Continent district for Norris Brothers, Inc., and now is manufacturers representative and distributor of oil field equipment. This change became effective April 15.

A modern concrete and steel warehouse has been erected by Mr. Long to house the products of manufacturers he is representing which includes the Robinson Packer Company of Tulsa with a stock of packers, limit plugs and other specialties and also the products of the Petroleum Equipment Company of Fort Worth, makers of pumping specialties. Mr. Long has assumed the general managership of this latter concern.

Having been associated with Norris Brothers, Inc., for a considerable period and having opened their Fort Worth warehouse some five years ago, Mr. Long is intimately associated with the oil industry in the Mid-Continent and is well known throughout this territory both among oil men as well as supply companies.

WRIGHT NAMED PRESIDENT

J. C. Wright, formerly vice-president and manager of sales, Wieman-Kammerer-Wright Company, Hollydale, California, has been elected president of that company, and has been succeeded in his old position by Edgar H. Wilson. Wilson formerly served the Reed Roller Bit Company on the West Coast with headquarters at Los Angeles, and previous to that connection spent several years as a salesman in the Mid-Continent.

Wieman-Kammerer-Wright Company has recently made large additions to its machine shop and welding department at Hollydale, a Los Angeles suburb.

ALCO HANDLING CABLE

Alco Oil Tool Company, Compton, California, has been appointed distributor for the American Cable Company products (Tru-lay and Crescent Brand wire ropes) in California.

W. B. Cornish, Southern California representative of the American Cable Company, will continue to cover the fields in conjunction with the Alco sales force.

The same service given in the past by the Alco Oil Tool Company to users of their products will be maintained in the distribution of wire rope.

Stocks will be carried in Compton, Ventura, Kettleman Hills and Taft.

The Speed and Service Iron Works located at 3409 McKinney Avenue, Houston, have secured the agency for the B. K. Appleman Gumbo Bit in the Houston territory. J. H. Hardcastle, R. L. Waxler and J. R. Martin have recently bought the company's present shop and offices on McKinney Avenue and are doing oil field machine repair work. In addition they are working on several pieces of new equipment which they plan to manufacture and which will be announced later.

McEverlast, Inc., manufacturer of protective coatings, headquarters 1754 Graybar Building, New York, N. Y., has recently put its Dallas factory in operation. D. T. Mason is in charge of the Dallas plant, and maintains headquarters at 1314 Magnolia Building.

R. J. Eicke, recently returned to Los Angeles from London, where he had been connected with Vickers, Ltd., for about seven years, and has accepted the position of sales manager for Specialty Oil Tool Company, manufacturers of fishing tools and other specialties for the oil trade.

ASCO STEEL
STANDS SUPREME

Every step in the production of Asco Steel is watched closely. From the selection of the raw materials to the finished product, the first thought always is to produce a steel that will give the best results to the makers of Oil Well Tools. Can we help you to produce better tools?

DISTRICT OFFICES:
541 McCormick Bldg., Chicago, Ill.

THE ANDREWS STEEL CO
NEWPORT KENTUCKY

"Favorite of the Oil Fields"

UNRIVALLED for SERVICE

FENWICK-REDDAWAY MFG. CO.
Newark, N. J.

CAMEL'S HAIR, COTTON and LINEN PRODUCTS
Mid-Continent Representative

A. F. Campbell
Tulsa, Okla.
Phone 2-1117

More "Graduation Exercises"

NORRIS BROTHERS' Turnbuckles

Turned inside out as Part of the Course in the - - -

"School of Hard Knocks"!

Living our lives in the shadow of oil derricks, we know something of the use and abuse to which oil-field equipment is subject. Yet it is doubtful if even on the most strenuous jobs the "punishment" comes up to that which we give regularly to Norris Brothers' Turnbuckles in the "School of Hard Knocks." Here, as a sample of the curriculum, is a stock turnbuckle turned *inside out* without fracture!

Product of the world's largest exclusively oil-industry turnbuckle manufacturers, these are made specifically for the oil industry. Large production means quality and low prices. Three strategic shipping points assure prompt delivery. Order from Norris Brothers, Inc., Robinson, Ill., Fort Worth, Texas, or Owensboro, Ky.

Norris Brothers' Turn Buckles

Made Especially for the Oil Industry

MILLER COMBINATION BAILER and SAND PUMP

MILLER
Sand Pump

Equipped with either of four type bottoms the Miller Combination Bailer and Sand Pump is equipped to meet every need.

Chisel Bottom

will save the expense of running tools and its chisel shape prevents sticking in tightly packed sands.

Bailer Bottom

will speed up production in cavy holes by time saved in picking up cuttings.

Star Bottom

used for cutting the sand loose and preferred by some to the Chisel Bottom.

Constructed of National Seamless Tubing and Sivyer Steel Castings, the Miller is built throughout of steel and eliminates the use of leather washers. Made in 2½, 3, 3½, 4, 4¼, 5, 5½, 7 and 9-inch sizes with any length up to 30 feet.

Regular Sand Pump bottom illustrated in position in the pump. →

Send for circulars and price list.

Sold through the leading supply stores or direct from the factory.

Patented—**March 1, 1921, No. 1370340; January 20th, 1925, No. 1523604.**

MILLER
Combination Bailer & Pump Co.
SAPULPA, OKLAHOMA

Squeaks from the Bull Wheel

Do you find the office force one big family?

No, I've found everybody congenial so far.

Bursting open the door marked "Private," the butcher confronted the local lawyer.

"If a dog steals a piece of meat from my shop, is the owner liable?" he asked the man behind the desk.

"Certainly,' replied the lawyer.

"Very well, your dog took a piece of steak worth a half a dollar about five minutes ago."

"Indeed," he returned smoothly. "Then if you give me the other half, that will cover my fee."

He—"We are coming to a tunnel—are you afraid?"

She—"Not if you take that cigar out of your mouth."

"You say your son was cured of his wildness by an operation?" asked the surgeon.

"Yes, that's what I said."

"That's interesting; what was the operation?"

"I cut off his allowance and made him go to work."

Two small children were engaged in a boastful conversation.

"My father," said the first, "has electricity in his hair."

"That ain't nothin'," came back the second, "my old man's got gas on his stomach!"

"Woman, dat ain't white mule in dat bottle—dat am pluto water.

You ain't gonna drink dat, am you?"

"Big boy, I ain't gonna do nothin' else.'

"Yes you is, honey, 'deed you is."

"He's a fine orator, although he doesn't say much."

"No, his speeches don't mean any more than a woman driver's hand sticking out of the car ahead."

Methuselah ate what he found on his plate,
And never, as people do now,
Did he note the amount of the calories count—
He ate it because it was chow.
He wasn't disturbed as at dinner he sat,
Destroying a roast or a pie,
To think it was lacking in granular fat
Or a couple of vitamins shy.
He cheerfully chewed every species of food,
Untroubled by worries or fears,
Lest his health might be hurt by a fancy dessert,
And he lived over nine hundred years.

"Listen, I wouldn't cash a check for my own brother!"

"Well, of course you know your family better than I do."

"Is this your car?"

"Oh, no, officer, not for 98 more installments!"

"Five dollars for a marriage ceremony! We haven't that much, Judge."

"Well, I can give you a companionate marriage for two dollars."

Child (to stranger): "Daddy, Daddy!"

Mother: "Hush, darling, that isn't Daddy; it's a gentleman."

"I enjoy a quiet smoke."

"Well, you will never be troubled with crowds while you smoke cigars of that brand."

"Does your wife boss you?"

"I wouldn't put it that way. I also have two daughters, yon know. I work under a commission form of government."

He seated himself in the grill and made a long study of the menu.

"Waiter," he said at length, "I have only two dollars with me. What would you recommend?"

The waiter gently removed the card from the hand of the stranger as he replied:

"Another restaurant."

The Jones family bought the auto they did because the earnest young salesman—

Laughed at all Mr. Jones' jokes.

Told Mrs. Jones she couldn't have a daughter that old.

Told Susie she looked like Mary Pickford, and dated her for a dance.

Told Willie Jones he had a build like Dempsey.

Said the Jones baby took after both parents.

And only smiled when the Jones Airedale nipped him.

"Were you upset by the bank failure?"

"Yes, I completely lost my balance."

They sat in the swing at midnight
But her love was not to his taste
His reach was but thirty-six inches
When her's was a forty-six waist.
—*Spruce Splinters.*

"So your new job makes you independent?"

"Surely. I get there any time I want to before eight, and leave just when I please after five."

"Pop," said the banker's boy, "you took a day off today, didn't you?"

"Yes, son. How did you know?"

The boy's nose wrinkled up a little, and he said, "You smell so of golf."

SKILLED SUPERVISION GUARANTEES THE QUALITY OF GULF PRODUCTS

COASTAL AND PARAFFINE CRUDES
GASOLINE — LUBRICATING OILS
NAPHTHA — GAS — OILS
WAX — PETROLEUM COKE
CYLINDER—ENGINE—CORDAGE

GULF REFINING COMPANY

General Sales Offices

PITTSBURGH, PA.

District Sales Offices

New York Boston Philadelphia Louisville Atlanta Houston New Orleans

Ocean Terminals

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